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Telephony.

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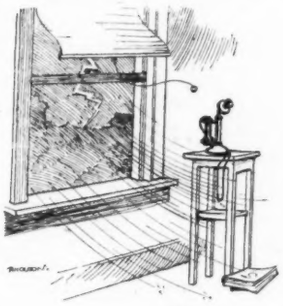

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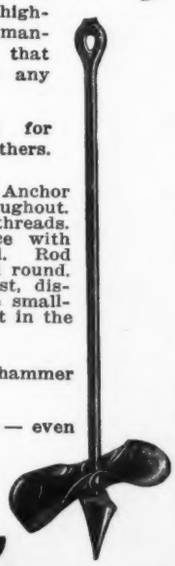

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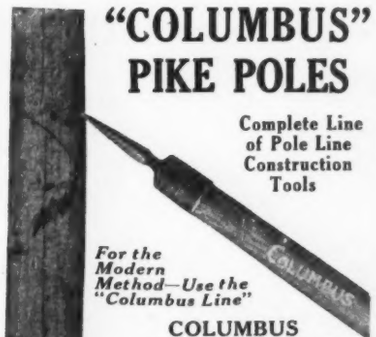

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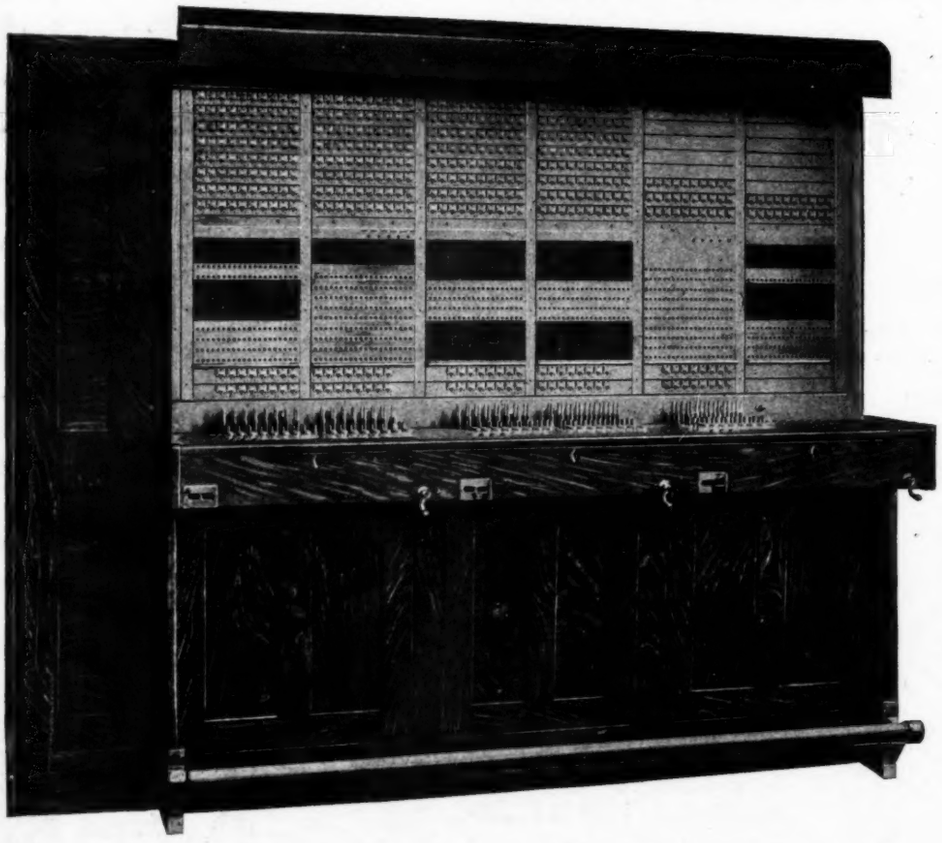

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Telephony.

THE AMERICAN TELEPHONE JOURNAL

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THE MEANING OF "SERVICE FIRST."

"Service First" means Greater Service, a Greater Number of Subscribers, Greater Harmony and Co-Operation, as well as Greater Efficiency.

Read This, Mr. Operator!

The compilation of Telephony's 1916 edition of the Directory of the Telephone Industry has been begun, and its publishers are again confronted, in many cases, with the difficulty of securing promptly information concerning the operating companies in the field. It is an annual source of surprise that so many companies are negligent in furnishing the data necessary to insure their being listed in this directory.

Naturally, one would assume that every company would desire to be included in such a list, and, in fact, would bend every effort to make sure that it was not omitted. As a matter of pride, every company should insist on being correctly represented in the directory, and to that end should co-operate with the publishers to the extent, at least, of promptly filling out the blank sent it for the recording of its size, location, etc.

The experience of Telephony in the past, however, has showed there is a woeful lack of such co-operation. Companies have been urged many times, without effect, to mail back the cards. Postage is furnished and all that is necessary is for some representative of the company to write out the information desired, mail the card and the job is done. Yet too many fail to do even this much.

Do better this year, Mr. Operator, when you receive Telephony's first card of inquiry. Don't slip it into a pigeon-hole. Take your pen in hand and fill out the blank at once. Then mail it. By attending to this promptly, you will help yourself and the whole telephone field.

We want to make the 1916 Directory of the Telephone Industry the most complete edition even issued, so it will be recognized as a worthy representation of a great industry. Help us in this laudable ambition by sending in the required information.

Your part in the production of this directory is small. It costs you nothing, and takes but a minute of your time. Do your share of the work that is meant to further your interests by sending in your information cards at once. This is the way you can help to make the 1916 directory a credit to the telephone industry of which you are a part.

The directory is now twenty-one years old. Please do your part to make it complete and comprehensive—a directory of the telephone industry.

Value of Service Work.

Service or inspection work is now recognized by the new United States Independent Telephone Association and several state associations as being of great importance to Independent telephony. The Pennsylvania Independent telephone associations were the first to take up systematic inspections and a study of conditions tending to affect the efficiency of transmission, making suggestions for remedying them. In practically all cases where inspections were made, the changes recommended were effected at very small expense, resulting in much better service and a greater volume of business.

A paper presented at the national convention last month by W. H. Hay, service engineer of the Western Pennsylvania Independent Telephone Association, tells something of the changes by which improvements in both local and toll service were effected.

Several maps were exhibited to show the results of work in improving transmission efficiency. A comparison of the areas of commercial transmission indicated on the maps for a number of places in the territory of the Western Pennsylvania association, shows that they were extended from 50 to 100 per cent. in eight months. The maps which accompany Mr. Hay's paper, published on other pages of this issue, afford an excellent illustration of what can be accomplished by work along service lines.

The Greater Heroism

By HERBERT KAUFMAN

This is a splendid century. This is the world's great hour. This is the mighty year of history. Nothing lies beyond the hills of yesterday so glorious as the living reality. Fame for untold ages dipped her pen in blood and wrote immortality upon the battlefield. Glory made monuments of crucifix and gibbet, and martyrs were torches that brought the light of reason and humanity.

But we fight in greater causes and battle with nobler weapons. Valor lives to serve and no longer serves to die. It was a fine folly to give and take the sword thrusts, but it is a nobler sanity to heal wounds than to bestow them.

The search for the Golden Fleece was a superb thing, but not so magnificent as the hunt for the bubonic flea. The quest for the Holy Grail studded the skies with imperishable names, but the extermination of the mosquito pest did more to make this earth a cleaner and a safer sphere.

The ancient heroisms were spectacular, dazzling and tremendous. Down the ghostly roads of time we see them tramp—the bronze shod phalanxes of Macedon, the grim hosts of Sparta, Caesar and his legions, Joan of the golden armor, the Little Corporal and his giant guard. We salute them and their time.

Theirs was an older and blinder civilization. They were not conquerors but destroyers. Their usefulness is ended; we are aware of another age—builders and creators. We live in and for this new truth, that real glory lies in the battle with menace and not with men. The scalpel, the microscope, the sewer, the drain pipe have achieved beyond Theseus' dagger and Aeneas' spear and Gallahad's lance and Bonaparte's cannon.

Wells brought more to his fellows with a bottle of anaesthesia than did Alexander. Carl's miraculous knife lifts him nearer to godship than did ever falchion or mace. The great adventurer is no longer marked by a trail of tears and fears and havoc. The new soldier serves for the common good. He comes in the name of faith—to heal, to cleanse.

Doubt and superstition and ignorance and wrong living and dirt are his only enemies. Brotherhood is his battle cry and hope his oriflamme. He bears but one weapon—imagination—and where he treads, he banishes despair and pain. "He fights at Armageddon and he battles for the Lord."

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A Day's Work of the New United States Association

First Meeting of the Executive Committee of the New National Organization—Division of Work Between the Two Offices of the Association—Finance, Valuation, Membership, Toll Line, Accounting and Service Committees Appointed—Duties of Each Body

By President C. Y. McVey

The executive committee of the United States Independent Telephone Association held its first meeting at the Hotel La Salle, Chicago, Saturday, January 8. There were present: A. F. Adams, Terry W. Allen, W. H. Bryant, George R. Fuller, F. B. MacKinnon, C. Y. McVey, H. Linton Reber, G. W. Robinson, W. J. Uhl, W. S. Vivian, and E. B. Fisher, chairman of the board.

The machinery for the conduct of the United States association was set up and put in motion. Plans were laid for making the organization most effectual. Questions of finance, general policy, and particular work were thoroughly discussed. The details of the association business to be handled by the Chicago and Washington offices were outlined so that there will be no duplication of effort and that the members will be able to keep in touch with all association activities.

Work of Washington and Chicago Offices.

The Washington office is to handle all matters pertaining to the Interstate Commerce Commission and other governmental departments, Vice-President MacKinnon being given charge of all such matters. Correspondence regarding valuation, accounting, etc., is to be directed to the Washington office and will be answered by it.

Secretary Vivian is to supervise the work of the service committee which, in its scope, is to include the work of the standardization committee which has attracted so much attention. In addition to handling the business of this committee and all correspondence in regard to questions of service, Secretary Vivian in his capacity of treasurer of the association, has the responsibility of looking after the association's finances, and in his combined office of secretary-treasurer is to have the responsibility of securing new members.

Such in general is the division of work between the two association offices.

Speaking more definitely, the executive committee decided to create six committees—finance, valuation, membership, toll line, accounting and service.

The finance committee is to have charge of keeping the treasurer supplied with the necessary funds to enable the big organization to do its work well. Of this committee, H. Linton Reber is chairman. The other members are: A. F. Adams, W. H. Bryant, E. M. Cooke, Wm. Fortune, George R. Fuller, S. G. McMeen, G. W. Robinson, and W. S. Vivian, secretary ex-officio.

The valuation committee with S. G. McMeen, chairman, and A. F. Adams, Wm. Fortune, H. Linton Reber, G. W. Robinson and F. B. MacKinnon, secretary ex-officio, as members, is a continuation of the joint committee on valuation created in August, 1915. This committee's work, as outlined, is to represent the association in all matters pertaining to valuation of telephone properties, especially in connection with the Interstate Commerce Commission's Division of Valuation.

The Membership Committee.

The membership committee is a very important one. To it is assigned the task of convincing every Independent telephone company in the United States of the necessity of enrolling as a member of the United States Independent Telephone Association. W. S. Vivian is chairman of this committee with the following able men as his fellow committeemen: F. L. Beam, F. E. Bohn, E. C. Blomeyer, H. L. Beyer, C. B. Cheadle, J. C. Crowley, Jr., J. C. Duncan, H. F. Farwell, Jay Greaves, L. E. Hurtz, W. W. Johnson, W. N. McAnge, Jr., W. J. Melchers, C. L. Norton, P. S Pogue, E. D. Schade, C. E. Sumner, J. M. Winslow, John H. Wright, and T. L. Youmans.

The Toll Line Committee.

For some time the toll line committee of the National Independent Telephone Association has labored to bring about an agreement with the American Telephone & Telegraph Co. for the reciprocal use of toll lines by Bell and Independent companies. At the Chicago convention in December, this committee reported encouraging progress. The executive committee approved of these negotiations and appointed the following committee:

Frank A. Davis, chairman; A. F. Adams, Terry W. Allen, S. M. Heller, B. G. Hubbell, S. G. McMeen, C. Y. McVey, W. J. Melchers, H. Linton Reber, G. W. Robinson, E. D. Schade, and F. B. MacKinnon, secretary ex-officio.

Instructions were given this committee by the following resolution, unanimously adopted:

Resolved, That a committee be appointed, called a toll line committee; that the committee be authorized to enter into negotiations with the American Telephone & Telegraph Co. for the purpose of securing a form of agreement for toll interconnection, which will be fair and equitable to the users as well as the carriers, and report back to the executive committee the result of the committee's conference so that, failing to secure such an agreement, the executive committee may then take such other steps as are necessary to secure the desired agreement or contract.

The accounting committee is to consist of: LeRoy Parker, chairman; C. A. Bennett; H. E. Bradley; W. M. Brown; A. C. Cragg; W. F. Goodrich; E. M. Prisk; H. Linton Reber, and F. B. MacKinnon, secretary ex-officio.

This committee is a continuation of the joint accounting committee which did such effectual work during 1915 in co-operating with the Interstate Commerce Commission in working out the problem of uniform accounting.

Plans for Service Work.

The organization of the service committee is along new and original lines. This plan looks to the most efficient sort of service work for all members of the association. The sub-division of the committee work and the personnel of those sub-committees are themselves an evidence of the value of the plan and once more calls attention to the results to be secured by a unified organization.

A general service committee is created with the following members: E. D. Schade, chairman; J. C. Casler, S. M. Heller, L. E. Hurtz, J. G. Ihmsen, G. R. Johnston, W. J. Melchers, C. B. Randall, W. J. Uhl, J. H. Wright, J. L. W. Zietlow, and W. S. Vivian, secretary ex-officio.

This general committee is to have charge of the work of the following sub-committees:

Committee on Inside Plant: G. R. Johnston, chairman; C. Ewing, Leo Keller, C. J. Larsen, J. W. Morrison, Jr., A. J. Seymour, A. L. Staderman, and W. S. Vivian, secretary ex-officio.

Committee on Outside Plant: L. E. Hurtz, chairman; R. L. Barry, Thos. Bromley, Jr., B. H. Brooks, C. Y. Chambers, W. H. Hay, E. L. Kline, George H. Metheany,

W. C. Polk, E. S. Sterrett, W. L. Stocking, J. M. Storkerson, and W. S. Vivian, secretary ex-officio.

Traffic Committee: F. V. Newman, chairman; E. D. Glandon, H. E. Davis, C. C. Deering, H. M. Dixon, George K. Gann, W. N. McAnge, Jr., C. S. Norton, A. J. Shands, T. J. Tune, and W. S. Vivian, secretary ex-officio.

Commercial Committee: C. B. Randall, chairman; H. L. Beyer, F. O. Cuppy, R. Hawkey, J. G. Ihmsen, J. M. McGregor, P. S. Pogue, H. B. Shoemaker, R. R. Stevens, P. J. Weirich and W. S. Vivian, secretary ex-officio.

Manufacturers' Committee: American Electric Co., L. G. LeBourveau; Automatic Electric Co., T. G. Martin; Century Telephone Construction Co., B. L. Moore; Frank B. Cook Co., John F. Tompkins; Cracraft, Leich Electric Co., O. M. Leich; Garford Mfg. Co., R. H. Manson; Kellogg Switchboard & Supply Co., H. D. Currier; Monarch Telephone Mfg. Co., W. H. Trimm; Stromberg-Carlson Telephone Mfg. Co., A. M. Haubrich; Swedish American Telephone Mfg. Co., F. W. Pardee; and W. S. Vivian, secretary ex-officio.

These sub-committees will take immediate charge over the particular branch of the service work indicated by the committee's title. Suggestions for the betterment of the service of member companies will be issued. Questions will be answered in connection with the service problems. A thorough study will be made looking to developing Independent telephony to its most efficient state.

The executive committee is to be congratulated upon the idea of the service committee and its sub-committees. The work of these committees will be watched with the greatest interest.

An advisory committee of engineers was created for the benefit of the valuation committee. This committee is to consist of: R. L. Barry, chairman; B. H. Brooks; Jos. Harrison; W. C. Polk, and A. L. Staderman.

The work of the finance, membership and service committees is to be conducted by the Chicago office of the association. Secretary Vivian is to act as chairman of the membership committee and secretary of the other two committees.

The business of the valuation, toll line and accounting committees is to be handled by the Washington office, Vice-President MacKinnon being secretary of all three committees.

As a further indication of the policy of the association, the following resolution was adopted by the executive committee:

Resolved, That the officers of this association be instructed to see that the provisions of the American Telephone & Telegraph Co. commitment to the Department of Justice, dated December 19, 1913, be adhered to; and that the officers be instructed to secure all the information they can, concerning any violation, or any attempted or suspected violation, and that such information be reported to the board of directors of this association for instruction.

Surely the day the executive committee worked for the United States Independent Telephone Association was a day well spent for Independent telephony. A fine start has been made. Every manager of every Independent telephone exchange owes it to his company to co-operate with the association's officers and committee members. And the executive committee made it possible for every manager of every Independent exchange to become a member by providing that any employe of a member company may become an associate member of the association with all privileges except those of voting.

The associate membership fee in the Association is to be the same as that for members—$5 a year. As we have said, a great start has been made by what promises to be a great organization.

Activities of the Southern States Association.

The Southern States Independent Telephone Association is aggressively pushing the organization of districts throughout the South, and during the month of February new districts will be located in Eastern North Carolina, Eastern Virginia, North Alabama, and Eastern Tennessee.

The Eastern North Carolina meeting will, in all probability, be held at High Point, N. C., which is in the center of the Independent development of that section. The delegates will be afforded an opportunity to inspect the instantaneous recall and automatic ringing system which has been recently installed at that point.

The North State Telephone Co., which operates at High Point, has long distance connections with the Postal Telegraph-Cable Co.'s long distance lines, which gives it commercial service to all points in Mississippi, North Carolina, South Carolina, Georgia, Alabama and Virginia. At this district meeting the visitors will be given an opportunity to test out the long distance lines of the Postal company.

The development that has been made by that company during the past year has been of great assistance to the Independent telephone companies throughout the South, and has been a big paying investment for the Postal company, the revenue received over these lines being most gratifying.

Districts during November were organized in West Kentucky, West Tennessee and North Mississippi, and the policy of organizing these districts will be actively carried out until every Southern state has from one to two districts affiliated with the Southern States association. Dates for the January and February meetings will be announced within a short time.

The executive officers of the Southern States Independent Telephone Association are at Corinth, W. N. McAnge, Jr., being secretary of the association.

Bell Company to Erect New Building in New Orleans.

The Cumberland Telephone & Telegraph Co. has completed plans for the erection of a new eight-story exchange building in New Orleans, La. Work will be commenced early this spring on the new plant, which will be located on a site adjoining the company's present office in Poydras street, and it is expected that the new equipment will be installed and in operation by January 1, 1918. The cost of the initial eight-story building will be approximately $355,000. Provisions will be made for the addition of four more stories, should the company's growth later necessitate increasing its facilities.

The building will have a frontage of 61½ feet and a depth of 159 feet. Steel, brick and hollow tile are to be used in its construction. When it is completed, new switchboard equipment of the latest type, with an ultimate capacity for 14,000 stations will be installed. This equipment will cost approximately $300,000.

A Live and Growing Telephone Company in the Southwest.

One of the most interesting and typical telephone enterprises in the country is the San Angelo Telephone Co., of San Angelo, Texas. It owns 1,300 miles of toll lines and operates 16 exchanges. It has a total of 4,000 telephones, 2,000 of which are in San Angelo, the home office and a city of 15,000 population.

The company contemplates erecting a new building at San Angelo in the near future. The company's construction account will reach $25,000 for 1916, and it equaled that in 1915 and 1914.

John Y. Rust is president and Jerry Y. Rust is secretary and treasurer. These young men own the company exclusively and have a record of performances which has not be excelled. As Jerry Rust says, "It is all paid for, too."

What Standardization Means to the Operating Companies

Importance of Standards—Central Office, Substation and Plant Equipment—Maps Which Show Greatly Increased Commercial Transmission Areas as Result of Service Work—Paper Presented at Convention of United States Independent Telephone Association

By W. H. Hay

The adoption of standards is a matter of most vital importance to Independent operating companies and the direct benefits to be realized by them as a result of such action cannot be too highly estimated. This assertion is based on the observations of one who has had the opportunity of studying conditions over a considerable territory, in which is included probably the entire gamut of Independent plants as regards size, design, efficiency and degree of competition.

Insofar as local requirements are concerned and considering each company's plant as a detached unit, a comparatively high standard of efficiency can be assumed in each case. But, considering the Independent field, broadly, the same degree of efficiency cannot be assumed, although conditions in the territory in mind have been greatly improved in the past year and a half, due to tentative steps having been taken along the line of standardizing methods generally.

While we know that local conditions will prosper, to a degree, under present methods, we must not forget the further benefits to be reaped by so constructing, maintaining and operating plants as to secure a larger proportion of that revenue—sometimes designated as "velvet"—accruing from increased toll and long distance business.

And in proportion as toll and long distance business covering a wider transmission area is built up and the fact is impressed on the public mind that Independent lines are in a position to furnish such service, together with a quality of transmission equal to, if not better than, that furnished by our competitor, so will local business increase and flourish. The very nature of Independent telephony carries with it public sentiment and the universal adoption of and adherence to standardization by Independent operating companies will be the means of accomplishing such an end.

It is the purpose of this paper to enumerate some of the conditions noted in the territory mentioned which have been corrected as the result of action along the lines laid down in Bulletin No. 1—Tentative Standards—and along other lines contemplated by the standardization committee; also to show the result in widened transmission areas following such action. The adoption of standards and adherence to them will not only eliminate such conditions but will render them impossible of recurrence. And what applies in these cases is, of course, applicable in the case of any Independent plant.

Central Office Equipment.

Under the head of central office equipment, a few cases are cited to illustrate how conformity to the standards recommended in the bulletin produced a direct and immediate beneficial effect.

In an office ranking high as a switching center, not only between points in the territory mentioned, but between points in it and adjacent territories, the toll to toll cords in the long distance switchboard were found to contain repeating coils of low efficiency, splitting the circuit. These coils were removed entirely from the cord circuit with a resultant gain of about 15 per cent in transmission on toll to toll connections, making possible commercial transmission between important centers in different states, not therefore possible.

In several other towns obsolete repeating coils of low efficiency were found in local to toll cord circuits which were replaced with standard coils and a marked improvement in transmission shown.

In two other towns of importance as switching centers, the toll board voltage was increased from 24 to 40 volts or more, and widened and improved transmission was gained as shown by a thorough course of transmission tests.

In several boards, all steel switchboard cords were replaced with cords of higher efficiency.

In one office, old type heat coils measuring eleven ohms were replaced with standard heat coils measuring less than seven ohms.

In another office, the cabling in the toll position was of No. 22 B. & S. gauge wire and in poor condition. It was replaced with No. 19 B. & S. gauge cabling and tests showed improvement.

Substation Equipment.

Under the heading of substation equipment, the chief cause of poor transmission could be attributed probably to inefficient transmitters. A number of instruments in the business places of long distance users and in pay station instruments used extensively for long distance, were found to be equipped with broken-down or inefficient, old type transmitters. There were replaced with transmitters of known standard transmitting qualities and an increase of toll business realized at once.

In the case of several local battery instruments, defective transmission was attributed to the line. The trouble was found to be in run-down dry cells—another case of "battery supply loss."

These few cases are typical of conditions tending to poor transmission and, as stated, will serve to illustrate how the application of standards as set forth in the bulletin are essential to the Independent operator. Further, it should be remembered that these principles have been applied to *present* plant, some of it quite old, resulting in highly increased efficiency at a comparatively small cost.

With the Independent manufacturers co-operating with the standardization committee and producing apparatus and equipment guaranteed to fulfill these transmission requirements and so certified by the committee through the co-operation of the Bureau of Standards at Washington, the Independent operator can feel assured that the proper transmission elements will be embodied in any new central office equipment he may have occasion to introduce into his plant.

The work of the standardization committee further contemplates the issuance of bulletins covering standards of practice as applied to the transmission elements of outside exchange and toll plant, standard rules of maintenance and standards as applied to traffic and operating.

Under the head of outside exchange plant, the citation of two cases will serve to show the necessity of standards to govern the allowable losses in subscribers' loops, so that when they become part of a toll connection, the transmission limit will not be exceeded.

One city of considerable size was served by one exchange, only, with the result that a large percentage of subscribers' loops exceeded the allowable limit of transmission loss. This plant has recently been rebuilt, sub-exchanges installed and No. 16 B. & S. gauge trunk cables used, so that all subscribers' loops are now within the limit and are efficient on toll connections.

In the other case, small gauge cable is used for trunking purposes between the exchange in which the toll board is

located and two other exchanges. The result is that when subscribers' exchange loops are added to the trunking length on a toll connection, the limit is exceeded. This was remedied by the installation of No. 10 B. & S. open copper circuits for toll trunks only, bringing the subscribers' loops within the limit of commercial transmission on toll connections.

Several cases were encountered where No. 10 B. & S. gauge toll lines were brought into the toll board through excessive lengths of No. 20 and No. 22 B. & S. gauge subscriber and trunk cable. This condition obviously greatly impaired the efficiency of these lines. It was remedied by the substitution of No. 10 B. & S. open copper for the section over which the lines passed through cable. The result was a most satisfactory increase in transmission efficiency and a marked improvement in the volume of toll business.

As a rule, cable in toll lines should be kept down to a minimum and where conditions render its use unavoidable, standard toll cable of the proper gauge and approved design should be used. It should be borne in mind that, while the transmission loss due to cable in a toll line may appear trifling in each single case, the cumulative loss is serious when a tandem circuit is built up for a long distance connection.

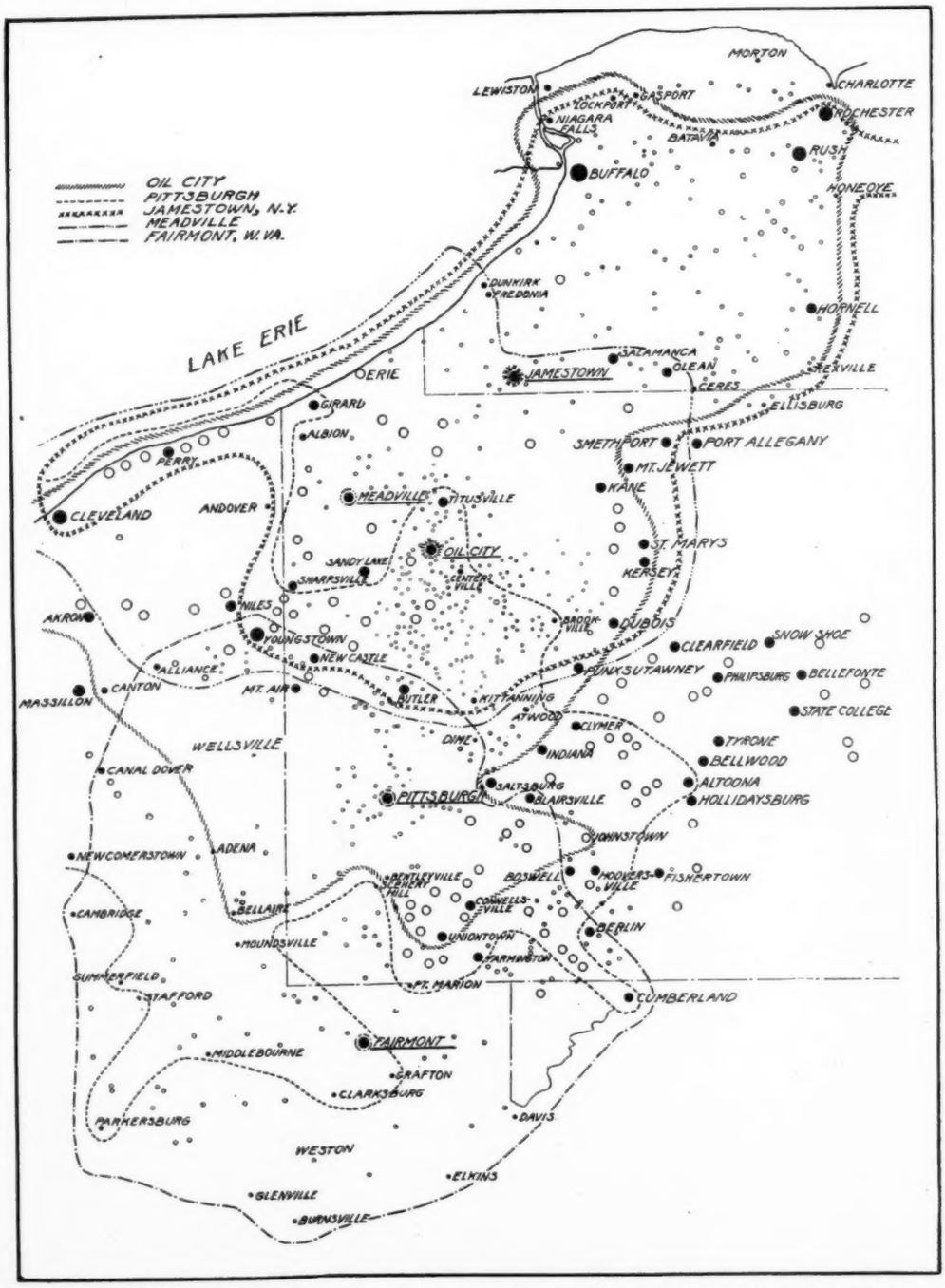
These are but a few instances of transmission loss in the outside plant. Others could be mentioned, among which are the use of inadequate insulators on toll lines and wrong schemes of transposition. It is the purpose of the future bulletins to be issued by the standardization committee to specify standards of practice which will place every Independent operator in a position to safeguard these losses and insure a more efficient and profitable plant.

Another serious source of transmission loss and impairment of service lies in poor maintenance and inspection methods. We all know that no telephone plant, no matter how well designed and constructed, will take care of itself. Eternal vigilance and a thorough, systematic method of maintenance is the price of efficient telephone lines.

The troubleman should be thoroughly imbued with the idea that his primary function is to *prevent* rather than clear trouble. Likewise it should be the function of the official who supervises the work of the troubleman to see that he is imbued with that idea and to tabulate and analyze his reports of trouble found and cleared. This will serve as a valuable check on the condition of the plant.

As stated, the standardization committee contemplates the issuance of a bulletin covering standard practice in reference to maintenance which, if adopted and adhered to by all Independent companies, will result in much higher efficiency in plant and will further promote the idea of uniformity in Independent practice.

Last, but by no means least—to the contrary, of most vital importance—is the matter of operating. In no other department of Independent telephony is standard practice more essential than in the operating department. Here the principles of standardization have a most direct application to the saving of money in the saving of circuit time. Standard operating rules will accomplish this in many ways by promoting



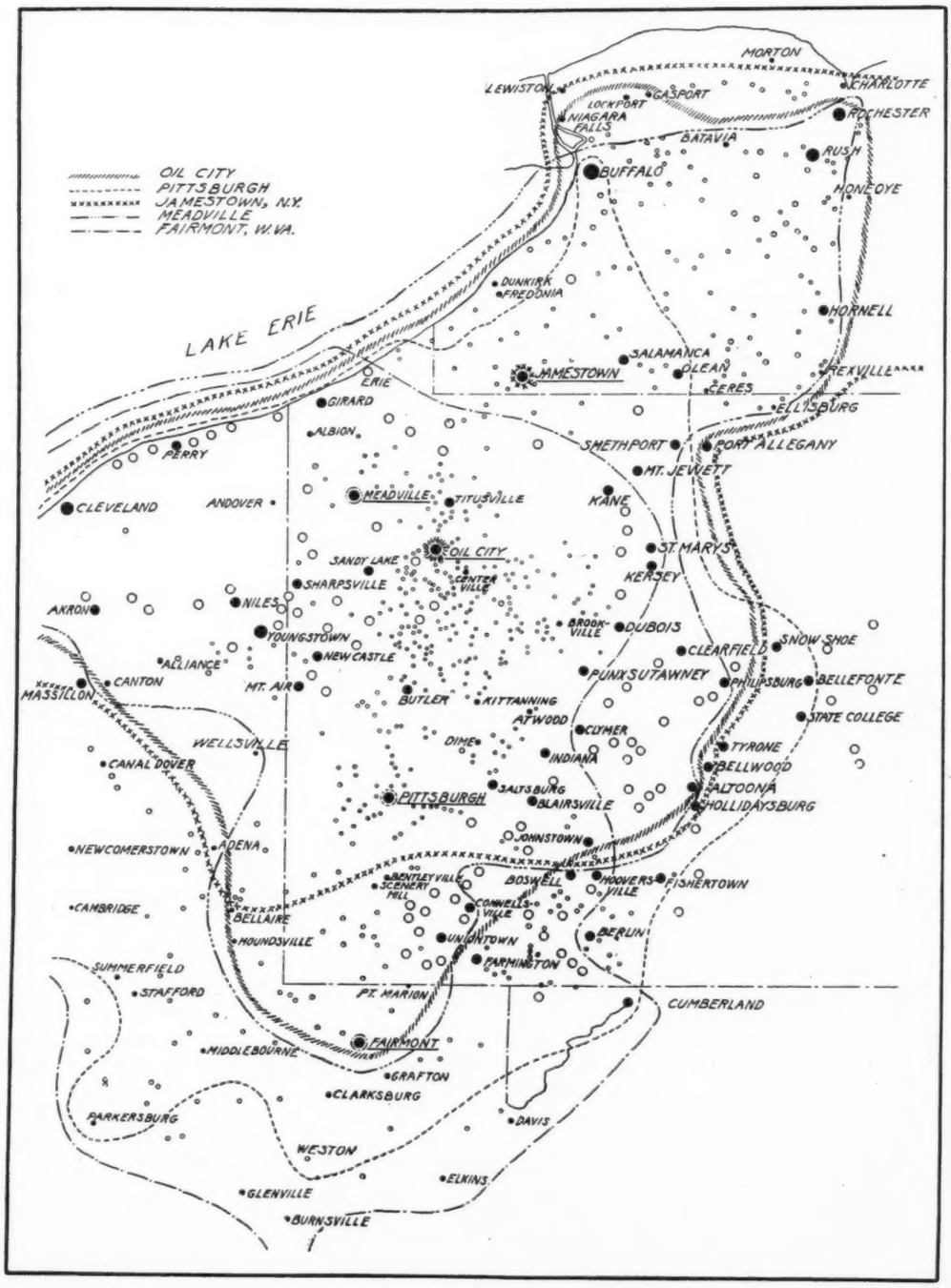
Commercial Transmission Areas of Several Cities, April 1, 1914, at Beginning of Service Work.

uniformity and unity of action among telephone operators.

Notwithstanding that considerable advancement has already been made toward standardization of operating practices, a wide diversity of method still exists in the Independent field. And in the face of this fact, it is to be observed, with great satisfaction, that the quality of service rendered by operators of Independent lines is of high grade, no doubt by virtue of the fact that they are operating Independent lines. But operating conditions can and are being improved by reason of the adoption of standard methods. It has been the privilege of the writer to conduct a series of operators' schools over the Western Pennsylvania and Western New York territories as a means of introducing and installing the long distance operating rules of the Ohio State Telephone Co. The rules were adopted by the territories mentioned and the impressions stated were formed as a result of observations made during the conduct of the schools.

It is to be hoped that standard operating rules for the Independent field will soon be formulated and adopted, for great benefit will undoubtedly follow such action.

The set of charts will serve to illustrate, graphically, the increase in transmission areas, as a result of the application of transmission standards as recommended by the standardization committee, in one year's time. And the statement that in the Western Pennsylvania territory, generally, toll and long distance business has increased from 20 per cent. to 25 per cent. in that time and is still increasing, will be further confirmation of the fact that adoption of standards means much to Independent operating companies.



Commercial Transmission Areas of Same Cities, December 1, 1914, as a Result of Service Work.

Merger in Kentucky.

The Independent telephone companies of Barbourville, Pineville, Middlesboro and Harlan, Ky., together with a number of rural connecting lines, have been merged into the Tri-State Telephone Co. with a capitalization of $100,000. Charles Chadler, of London, Ky., is president of the new company and G. S. Brock, secretary and treasurer. No immediate changes are contemplated, it is said, in operation of the various exchanges, although improvements in the systems are in prospect.

To Build New Exchange.

The Louisville (Ky.) Home Telephone Co. has taken out a permit for the erection of a branch exchange building in the Highlands to serve an important part of the residence section of that city. This building, which alone will run to about $20,000, will be of an architectural type appropriate to the surrounding structures which are such as are to be found in high class residence sections. The site has been purchased at Bardstown road and Rosewood avenue, and work on construction will begin shortly.

The plans call for a building, 45 by 57 feet, of brick and concrete construction. Conduit construction preparatory to utilization of the building has been completed and the Louisville Home will inaugurate service in the new exchange with switchboard facilities for 2,500 lines. An ultimate capacity for 7,500 lines will be provided.

Attitude of United States Government Toward Business

Relationship of the Department of Justice and the Federal Trade Commission as Expressed by the United States Attorney General—Policy of Department of Justice in Prosecuting and Fixing Penalty for Violation of Sherman and Clayton Acts

Since the enactment by Congress of the federal trade commission law and the Clayton law, the federal trade committee of the Chamber of Commerce of the United States has been constantly presented with inquiries, not only relative to the relationship which it might be expected would be established between the Department of Justice and the Federal Trade Commission at points where jurisdiction seems to overlap, but also as to the probable attitude of the Department of Justice with respect to future proceedings.

It was explained to the attorney general by the representatives of the national chamber of commerce that, if he would express himself, it might be regarded as reassuring to the public mind and at the same time dispel some of the uncertainty which has heretofore existed. It became known recently that several interviews have resulted between the attorney general and members of the federal trade committee.

Cause of Misunderstandings of Sherman Act.

By way of introduction the attorney general expressed the view that much of the misunderstanding that exists in some quarters in relation to the Sherman act, is due to the fact that, in the minds of many, it has come to be thought of as a statute apart from the general body of laws—one by nature unlike other laws, especially as regards the function and duty of those charged with its enforcement. This, he pointed out, is not the case at all. On the contrary, the Sherman act is enforced by the Department of Justice in the same manner and according to the same rules of policy as other statutes—with the same care and with neither more nor less rigor.

Plain or intentional violations are proceeded against vigorously as under other statutes. When, as with all statutes, doubtful cases arise in which there was no intent to violate the law, they are dealt with just as similar cases under other statutes are dealt with—that is, with a view to enforcing strict compliance with the law, but without unnecessarily stigmatizing or unnecessarily burdening with litigation, persons who have been honestly mistaken as to the law and who stand ready to rectify their mistake.

Another cause of this misunderstanding, said the attorney general, is the persistent misrepresentation to which the Sherman act has been subjected by propagandists who are opposed to the competitive principle and who seek to undermine that principle by attempting to create in the public mind misgivings and confusion both as to the meaning and as to the manner of enforcing the law embodying it. Four points were then taken up:

First. The complaint that the law is uncertain.

Second. The policy of the Department of Justice as regards the method of enforcing the law in admittedly doubtful cases.

Third. The means adopted by the department to guard against unjust prosecutions.

Fourth. The policy of the department in cases where it and the Federal Trade Commission are both charged with the enforcement of the law.

Concerning the first point, the attorney general stated that while concededly there is in the law of restraint of trade an area of doubt, in the vast majority of cases it is not difficult to tell whether a proposed transaction is or is not in violation of the statute, and the doubt is certainly no greater than that which is accepted as a matter of course in the application of other laws. Such doubt as there is, he further stated, will be greatly reduced by decisions in the shipping pool case, the anthracite coal cases, the Harvester case, the steel case, and the United Shoe Machinery case, which are now pending in the United States Supreme Court.

This led to the question as to the policy of the department as regards the method of enforcing the law in those cases which are admittedly doubtful. On that point the attorney general stated that, where men have entered into a transaction believing in good faith that the transaction is a lawful one, and subsequently upon complaint made the department reaches the conclusion that the transaction was not in accordance with the statute, but is yet satisfied of the good faith and innocent purpose of the parties and can see that there was ground for the view of the law upon which they acted, it has not been and would not be the policy of the department to invoke extreme penalties against them.

In such a case the department would consider that the just and appropriate and quickest way of enforcing the law would be by a civil proceeding in which the question involved could be contested or a consent decree entered, accordingly, as the defendants desired, or by a notice to the parties of the department's conclusion with opportunity to abandon or modify the transaction.

The choice, as between these two procedures, would be determined by the circumstances of the particular case. The attorney general claimed no originality for this policy. On the contrary, he stated that it was neither original nor peculiar to the anti-trust law, but is the policy of the department and prosecuting authorities generally in the enforcement of all laws.

In this connection, the attention of the attorney general was called to paragraph E of section 6 of the Federal Trade Commission law which authorizes the commission "upon application of the attorney general, to investigate and to make recommendations for the readjustment of the business of any corporation alleged to be violating the anti-trust acts, in order that the corporation may thereafter maintain its organization, management and conduct of business in accordance with laws." He was asked whether he could state what the policy of the Department of Justice would be with regard to invoking that provision.

Fixing Penalty for Violation of Law.

He replied that while he felt certain this would prove to be a most serviceable provision in solving practical questions which often arise in the enforcement of the anti-trust laws, it was as yet too early, in his judgment, to attempt to particularize as to the cases in which the Department of Justice should call upon the trade commission for assistance under this provision. Speaking generally, he stated he did not understand the provision contemplated that he should refer to the commission the question whether the law had been violated in a given case, but rather questions of the feasibility, adequacy or advisability of proposed remedies from a practical standpoint.

Where questions of the latter sort do not arise, or where

they arise in a form which presents no difficulty, no purpose would be served, of course, by having the parties go over the same ground before the commission that had already been gone over before the department. On the other hand where, in working out the remedy in a particular case, difficult questions of business organization and of finance shall be encountered, it will be the desire and the policy of the department to seek the assistance of the trade commission. In two recent cases which have arisen where courts have declared the combinations assailed to be unlawful, the department has proposed to the courts that the assistance of the trade commission be sought in working out plans of dissolution.

The discussion then turned to the measures taken by the department to guard against prosecutions for which there is no just ground. On this point, the attorney general stated that no proceeding is ever instituted until after the most painstaking and exhaustive investigation of the facts which it is possible to make. As a part of this inquiry, the person or corporation against whom complaint is made, unless it has already declared its attitude, is given full opportunity to submit its defense before any action is taken. This is done, he pointed out, not only as a matter of justice to those against whom complaints are made, but as a matter of prudence on the part of the department, for least of all has the department any interest in instituting a suit which should subsequently turn out to be without foundation.

As to its policy in cases where both the department and the Federal Trade Commission are charged with the enforcement of the law as under the Clayton act, the attorney general stated that the department would, in general, be guided by the principle which governs the federal and the state courts in cases where they have concurrent jurisdiction. That is to say, in any such case if the Federal Trade Commission were the first to exercise jurisdiction, the Department of Justice would await the conclusion of the commission's proceedings before taking any action, unless special circumstances should dictate a different course of procedure.

While the interviews with the attorney general, the federal trade committee believes, need no interpretation, the committee offers the following summary thereof:

Persons entering into transactions in good faith, having good cause to believe them lawful, will not be criminally prosecuted, but if their business be found violative of the law, they will be given opportunity to readjust in conformity with the law without legal proceedings, unless consent decree in a civil suit is desired.

The Department of Justice intends to give substantial recognition to the provisions of paragraph E of section 6 of the Federal Trade Commission law, which authorizes the commission

upon the application of the attorney general to investigate and to make recommendations for the readjustment of the business of any corporation alleged to be violating the anti-trust acts in order that the corporation may thereafter maintain its organization, management, and conduct of business in accordance with law.

"In cases as to which both the Department of Justice and the Federal Trade Commission have jurisdiction, such for example as those arising under the Clayton act, the department will await the conclusion of the commission's proceedings as to any matters in which the commission's jurisdiction is first invoked.

It is not improbable that the working between the Department of Justice and the Federal Trade Commission is to follow along the same lines as have been established by custom as between the department and the Interstate Commerce Commission with relation to violations of the act to regulate commerce, as a result of which arrangement the department rarely, if ever, institutes proceedings without the recommendation or sanction of the Interstate Commerce Commission."

Telephone Activities of Massachusetts Commission in 1915

Resume of Work Done by the Telephone and Telegraph Department of the Massachusetts Public Service Commission During the Past Year—Character of Complaints Handled—Work Done for the Legislature—Important Rulings Made by the Department

The 1915 report of the telephone and telegraph department of the Massachusetts Public Service Commission, of which William H. O'Brien, of Boston, is chief, has been made public. The work of the department, which was established in January, 1914, has continued along the lines indicated in the last annual report. The commission is authorized to require adequate telephone and telegraph service without discrimination. The department, however, is not yet convinced that it is practicable or desirable to attempt to achieve that result by setting up definite and arbitrary traffic and plant standards for telephone service.

While the department believes that the matter is deserving of further study, the methods outlined in the last annual report will, for the present at least, be continued. These include the inspections of traffic and plant conditions at various exhanges, either as a result of complaints or upon the initiative of the department, service tests and canvasses of subscribers for the purpose of ascertaining the sentiment of the community as to the quality of service, and conferences with the company in connection with the adjustment of complaints.

Where complaint is made of any service conditions, such as excessive delay in the installation of new service or in the restoration of service after interruption, it is customary for an inspector to be assigned to examine the records, and wherever necessary, the plant and equipment of the exchange involved. When the conditions in the exchange visited are found in any respect unsatisfactory, a report is made to the office of the vice-president of the company. As a result of such reports, many improvements in plant and service conditions have been made with a view toward preventing similar troubles in the future.

Work of the Plant Inspector.

The plant inspector of the department, between May 25 and November 30, made 116 visits of inspection to 56 different exchanges, 45 of which were in the metropolitan district. Of these inspections, 60 were the result of complaints, and the remainder upon the initiative of the department. During the year the traffic inspector made complete studies of 15 exchanges and spent seven days and evenings at the company's central observing board on general observation work. From this board it is possible to observe the service in a majority of the exchanges within the metropolitan district, the average daily number of exchanges under observation being 30.

In addition, the same inspector made special observations at local exchanges as a result of complaints. When complaint is made, either of the service furnished by the company or of the misuse of a party line by other subscribers, the com-

pany, at the request of the department, frequently places lines under observation for periods of from three days to two weeks.

In connection with the work begun by the department in 1914 in the matter of excessive use of service on party lines, the results have been very gratifying and reports have come both to the department and to the company, indicating a general desire on the part of subscribers to co-operate in the elimination of this most serious obstacle to a reasonable standard of service on party lines.

As to complaints, the following may be cited as illustrative of the work of the department:

Mr. X. complains that his application for service has been on file for some time and that he is unable, according to the report of the company, to get service, owing to "lack of facilities." The department's investigation led to the installation of service within 24 hours.

Mr. Y. reports to the department the loss of a large percentage of incoming calls, causing him heavy monetary loss, and that this condition has continued for a considerable period. Within two hours an inspector from the department had located the trouble.

Mrs. W. reports being unable to use her line occasionally during the late afternoon and evening, owing to excessive use by another subscriber on the line. An observation showed that the party complained of was using the line for periods of 20 to 50 minutes on unimportant social matters and that the frequent requests by Mrs. W. and others for permission to use the line were denied, sometimes in very emphatic language. The matter was adjusted by requiring the offending subscriber to take a service commensurate with his needs.

Of the complaints received, there were some 125 cases requiring the services of an inspector. The complaints cover almost every phase of telephone service, and have, in almost every instance, been adjusted to the satisfaction of subscribers. It has been the aim of the department to encourage the filing of complaints and inquiries by telephone, with the result that a large number of such cases are disposed of with a minimum of delay and red tape.

Summary of Work for Legislation.

In the hearings before the mercantile affairs committee of the state legislature on matters affecting telephone rates and service, the commission was represented by the chief of the department. Several of these measures found their way to the commission either by legislative reference or by petition. To the more important of these a brief reference is made in the report.

The house of representatives requested the commission to furnish certain information as to the relations between the American Telephone & Telegraph Co. and the New England Telephone & Telegraph Co., and as to certain other matters affecting rates charged by the latter company. The report of the commission in response to that request was printed as House Document No. 1856, and is to be found in the appendix of the present report.

Petitions involving a fundamental inquiry into the rates and service of the New England company were filed with the commission after the legislature had found that no legislation was necessary in relation thereto. These petitions have been placed on file at the request of the petitioners until an appropriation sufficient for the purposes of the inquiry has been considered by the legislature.

A bill relative to the installation of meters at subscribers' stations for the registration of measured calls received an adverse report in the legislature upon the ground that the proponents had their appropriate remedy through petition to the commission. A petition of the same general tenor as the legislature bill was accordingly filed with the commission and after a hearing the board issued an order, included in the appendix of the report, directing the company to reduce the annual charge for such meters from $3 to $1.50.

Rates for extension telephones have also been investigated, and an early decision is anticipated. In the matter of four party service, which was restored to schedule in 1914 by order of the board, subscribers, on and after February 1, 1916, will enjoy divided ringing. This change was agreed upon by the company after conference with the commission.

Inquiry Into New England Service.

The toll service of the New England company was somewhat demoralized during the summer months of 1915. The delay on toll service between Boston and important toll points in the state became so general that the inspectors of the department were directed to make a special investigation of the matter. It was discovered that the company was short of circuits; that calls were frequently held up for periods ranging from a half hour to two hours or more, and that the ordinary supervision applying to such service was very much reduced.

The department has recently received from the company a long report showing the conditions under which the service was handled. The claim of the company in connection with this failure of service is that it was impossible to have foreseen the extraordinary traffic which developed during that period and that provisions had been made to handle the normal increase. A complete study is being made of this phase of the service with a view to making such recommendations as will minimize the possibility of a recurrence of similar conditions.

The report also points out that it was impossible, during the continuance of the conditions described, to inform subscribers of the amount of toll charges at the completion of their calls, owing to the heavy demands upon the operators because of insufficient circuits properly to distribute a largely increased volume of traffic. As a result of improvements already made this particular cause of complaint has been removed, so that it is now possible for subscribers to be informed promptly of their toll charge amounts.

The chief of the department attended the hearings in connection with the inquiry into the local rate situation in New York City early in the year, and was assigned by the commission to represent the board at the San Francisco convention of the National Association of Railway Commissioners, in October. This was attended by representatives of over 30 state commissions, and important telephone and telegraph rate and service problems were discussed at the meeting.

The report also contains brief reference to the Foster stock ticker case, which is now pending in the Massachusetts Supreme Court on appeal of the companies ordered to restore service to the petitioner, and to the prospect of the board's being asked to consider the inter-company tariffs in force between the Western Union Telegraph Co. and the New England Telephone & Telegraph Co. with relation to handling through messages. It is likely that this subject will later be considered as a whole.

The departmental organization remains the same as a year ago, consisting of the chief and two inspectors, Jas. M. Cushing and M. J. Conley. Early in the year John H. Donovan, the telegraph inspector, resigned, and was succeeded by Mr. Conley, who came to the department after 20 years of telephone plant work.

Commends Telephone Company for Teaching Courtesy.

The Terre Haute Tribune, in an editorial, is at some pains to commend the Citizens Telephone Co., of Terre Haute, Ind., for its continued and persistent effort to teach courtesy. Every issue of the company's directory contains specific directions as to the manner in which a telephone call should be placed. Emphasis is placed upon the necessity for courtesy and patience.

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Jay G. Mitchell

Quiz Questions on the Preceding Installment.

280. What is one objection to the indirect type of relay armature?

281. Why cannot the indirect type of relay be adjusted to secure a long travel of the contact springs?

282. What is the relative importance of the relay in modern telephone equipment?

CHAPTER XIII. Direct Current Relays (Continued).

283. *Relays with more than one winding.*—It is very often necessary to provide an ordinary type of relay with more than one winding. This may be required by several different sorts of conditions in the operation of the circuit. Quite often it is necessary to connect a single relay directly across the talking circuit for the purpose of passing battery current out to the line for the operation of transmitters, or to obtain supervision, or both.

In such cases a relay is used having two windings which are as nearly alike in all respects as possible. Through one, the current passes out to the line from the battery, and through the other, the current returning from the line is passed to the battery. Since the battery is common to *all* the talking circuits, it is necessary to prevent any flow of the telephonic voice currents from the two sides of the various circuits to it. The direct currents flowing from the battery to the line will be passed readily by the two coils of such a relay. The alternating voice currents *must not* pass the relay windings and they must encounter the same obstacle on one side of the circuit that they do on the other.

For this reason the two windings on the relay used for this purpose must be as nearly alike as possible. If they have the same number of turns of the same average diameter, the same size of wire, and are placed so that each has the same magnetizing effect upon the relay core, they will offer the same impedance to the telephonic voice currents.

284. *Impedance of double-wound relays.*—Impedance, it will be remember is composed of the resistance of the coil or circuit plus its inductance reactance. In effect, it affects the flow of the alternating voice currents in the same way as a very high resistance would affect it. Any given coil having an iron core and frame will always show the same impedance to alternating current of any given character and frequency. Therefore two coils, having practically the same characteristics, such as the two coils wound on the core of the same relay, will also show practically the same impedance to alternating currents of *all* frequencies.

When the double-wound relay is to be used in this way, it is necessary to so connect the two coils on its core, as to produce the same magnetic polarity in the core as a result of the current flowing in *both*. If care is not used to secure this result, the effect of the two coils will not be in accord. When they do not act in accord in magnetizing the core and frame, not only is it impossible to secure any operation of

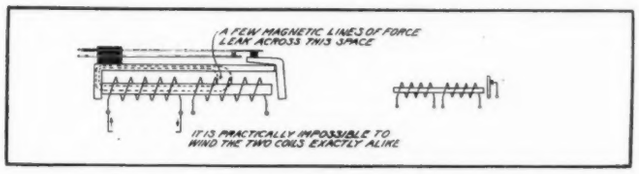


Fig. 118. Approximately Balanced Double Wound Relay.

the relay armature, but the two windings carrying current, neutralize the magnetic effect of each other and their reactance is practically destroyed.

In such a case, the transmission loss through the relay would, of course, be very great, the exact amount of the loss depending upon the ordinary ohmic resistance of the windings.

285. *Why an exact balance in the impedances of the two windings is not ordinarily obtained.*—Ordinarily it is sufficient to wind the two coils on the two ends of the relay core, one near the armature and one near the return frame at the rear end. It should be noted, however, that this does not provide a scientifically exact balance between the impedances. The magnetic lines of force, due to the effect of the current in either coil, will not *all* pass through *all* the turns of the other one. Some of the lines of force produced by one coil will be lost, as far as the other one is concerned, by leakage. This is shown in Fig. 118, in which an impulse of alternating current is supposed to be flowing in the winding of the coil on the end farther from the armature.

It may be readily seen that, in this case, a part, very small it is true, of the magnetic lines of force due to the effect of the current in the left coil will be lost by leakage and will not pass through the turns of the right coil. But in order that the two coils shall be *exactly* balanced as to their impedance, it is necessary that all the lines of force produced by the one, shall pass through *all* the turns of the other. The difference in the impedance of two coils on the same core is very slight, but it exists. It is rendered somewhat more important by the difficulty of winding two coils on the same core having exactly the same number of turns of exactly the same average diameter and of exactly the same resistance.

The general subject of balanced impedances will be taken up later, but it should be very plain that, were the impedances not approximately balanced between the two sides of the talk-

ing circuit and the battery *common* to all the circuits, a serious loss in transmission—not to mention possible cross talk between circuits, and other troubles—would result.

285. *The differential relay winding.*—There is another circuit condition which calls for two windings on the one relay

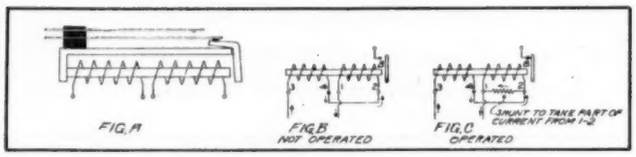


Fig. 119. Differentially Wound Relay.

core. When it becomes desirable to pass current through the winding of the relay without operating it and to operate it later by the same current when some other condition in the circuit has been established without disturbing the general condition as to the current flowing, the differential arrangement of relay connections is used.

This is very nearly the reverse of the condition of balanced impedances called for in battery feed relays. The two windings of the differential relay must be so connected as to tend to produce opposite magnetic polarity in the core and frame. The effect of the current in one coil is then neutralized by the effect of the current in the other. When a condition is introduced by which the current in one coil is greatly weakened or strengthened while the current in the other coil remains at the same strength, the balance in magnetizing effect is destroyed and the relay is operated by the stronger magnetizing force of one coil. This is illustrated in Fig. 119.

286. *Operation of differential wound relay.*—The relay as shown in Fig. 119-*B* will not be operated, although the current may be flowing in its coils as indicated by the solid arrows. The coil 1—2 is tending to create a positive or north magnetic pole at *B* while the effect of the coil 3—4 is to tend to create a south or negative pole at the same point. In other words, the effect of the two coils is to neutralize each other.

Now suppose that a shunt is placed around the coil 1—2, as shown in Fig. 119-*C*. A part of the current flowing in the coil 1—2 will be diverted and will now flow through the shunt. This will reduce the amperes flowing through 1—2, and therefore the ampere turns, while the ampere turns of 3—4 will not be reduced. Accordingly the magnetizing force of 3—4 will be the greater; the reduced effect of 1—2 will be *more* than neutralized by the effect of 3—4, and the resultant magnetic flux in the core will cause the relay to be operated.

287. *Method of obtaining exact balance in the impedance of*

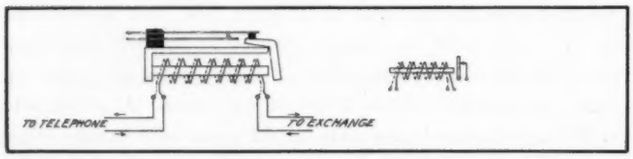


Fig. 120. Relay with Accurately Balanced Impedance.

the two windings.—In some few cases it is necessary to insert the coils of a double-wound relay in series with the two sides of the talking circuit. When this is done, the balance between the impedance of the two windings must be very exact. If the two windings have precisely the same impedance, and they are connected in the circuit so that their combined effect is non-inductive, the transmission will not be affected by their reactance.

If the two coils are not perfectly balanced, the excess impedance of the one will not be entirely neutralized by that of the other and will interfere with the transmission, causing a loss. Under these conditions, the two relay windings are made simultaneously at the time the coil is wound in the factory. That is to say, two wires are wound on the spool side by side, instead of one wire as usual.

By this method the finished relay is provided with two coils of which each part of the winding of one is matched by a similar part of the winding of the other. There will not be an inch of one winding in such a relay, if it is properly made, which is not exactly matched in position, resistance and magnetizing value by the other. In Fig. 120 such a relay is shown inserted in the talking circuit. If it be assumed that the talking current momentarily flows in the direction indicated by the solid arrow, it may be very readily seen how the outgoing current and the incoming current in the circuit effectually neutralize the inductance reactance of the entire relay by passing through the two windings. It will be remembered that wire-wound heat coils must also be wound non-inductively in order to avoid a great loss in transmission in their windings.

288. *The locking relay winding.*—It is sometimes essential to operate the relay over one circuit and to retain the armature

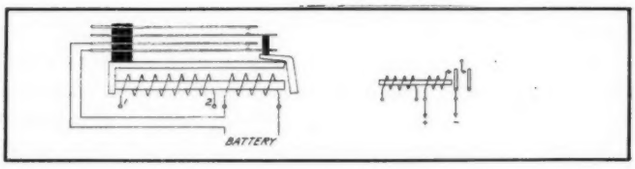


Fig. 121. Locking Relay Winding.

in the operated position by current received over another. In such cases it is customary to provide the relay with a second winding which is energized *after* the armature has been pulled up by the operating winding. Such an arrangement is shown in Fig. 121 in which 1—2 is the operating coil and 3—4 the locking coil. The circuit of the locking coil is normally open and is closed through the contact springs after the armature has been pulled up.

When the operating current is alternating in character, it is necessary to introduce some modifications from the usual in the mechanical design of the relay. The ordinary direct current relay structure will not operate satisfactorily under these conditions. The reason will be very clear when it is remembered that the locking coil must build up a magnetic field in one direction to retain the armature, while the operating coil is creating an alternating magnetic flux in the *same core.*

At certain times the effects of the two coils are in accord. At other times the effect of one is opposed to that of the other. Should the operating current be withdrawn at the instant when the two are in opposition, the armature would not be retained. The principle to be employed in the proper design of this class of relay will be taken up in connection with the discussion of alternating current relays.

(To be Continued)

Some Thoughts on Government Ownership of Telephones

Stand Taken by Governors of the Different States—Attention Called to Congressional Reports on Business Methods of Postal Department—Results of Government Ownership in England—Paper Presented at Convention of Ohio Independent Telephone Association

By H. P. Folsom

It is not my purpose in this paper to go exhaustively into the subject of government ownership of telephones and telegraphs; but only to call your attention to certain facts and figures bearing on the subject. The whole question is being taken up by committees and associations in many parts of the United States and a vast amount of information and statistics are being gathered for and against the proposition.

POSTAL SYSTEM CITED AS EXAMPLE OF EFFICIENCY.

Those in favor of the proposition point to the postal system of the United States as being the most conspicuous and best example of what government ownership can accomplish. They argue that if the government can successfuly and efficiently manage the postal system of the United States, it can successfully and efficiently manage the telegraph and telephone systems. Indeed, their whole case rests upon this broad assumption.

The postmaster-general under President Taft and our present postmaster-general, have both recommended the taking over of the telegraph and telephone systems of the United States by the government. The subject is one of vast importance, not only to us as telephone men, but to every individual who has the best interests of our country at heart.

The latest investigation and report on this subject, was made by the committee on telegraph and telephone rates and service of the convention of the National Association of Railway Commissioners held October 12-15, at San Francisco, Cal.

The committee was composed of the following named commissioners: C. A. Reynolds, chairman; Beecher W. Waltermire, C. P. Ramstedt, and Edwin F. Coard.

Several months before the committee's report was to be submitted, its chairman addressed a letter to many prominent men in the United States, including each of the governors of the different states. The letter propounded the following questions:

1. Should the government own all electrical means of communication? or

2. Should the government continue its policy of dealing with these systems of communication, as regulated monopoly?

Many letters were received from prominent men in different parts of the United States. Samuel Gompers, president of the American Federation of Labor, answered as follows:

"Replying to your inquiry of May 5, permit me to say that the American Federation of Labor has in its economic declarations the following demand, 'Nationalization of telephone and telegraph.' The members of organized labor have felt that these great national monopolies ought to be owned and controlled by the federal government, and have for many years gone on record officially as favoring that position."

The committee was liberally supplied with pamphlets and statistics on both sides of the question. The letters from the state governors show the governors of South Dakota and North Carolina were in favor of government ownership; and the governors of New Hampshire, Wyoming, North Dakota, Rhode Island, Minnesota, and Wisconsin for regulation.

And here is a significant fact to which I wish to call your attention—all of the other governors of the 40 remaining states declined to go on record. These 40 men have either not made up their minds, or are waiting to see which way the wind is going to blow. If this large majority of governors has no opinion of its own—or is afraid for political reasons to express it—we have a very dangerous condition confronting us.

These men constitute the timber out of which we frequently make presidents, senators, congressmen, and members of the cabinet. They are the men who help make political platforms and shape public opinion.

In this connection we must constantly bear in mind that in all times, in all lands, public opinion has control at the last word. Public opinion is but the consensus of individual opinion and is as much subject to change or education. It is based on information and belief. If it is wrong, it is wrong because of wrong or insufficient information, and consequent erroneous belief. How necessary it is then that we help to get the truth before the public.

It is manifest that if the post office department is not economically and efficiently managed, then one of the strongest arguments for government ownership of all electrical means of communication, falls to the ground.

Let us read what expert accountants and committees of congress, composed of both political parties, have to say on the subject of the business methods and bookkeeping of the postal department.

One committee makes use of the following language:

> Having before it this record of unreliability of departmental statistics, this committee could not, with due regard to the fullfilment of its duties, accept the departmental statistics as accurate and reliable unless independent investigation and checking from other sources confirmed the figures the department had given.

Nor is this condition chargeable to any official or set of officials. Nothing short of a revolution in method and organization of the post office department, as at present constituted, could effect a change in the present system of accounting. The same is true of the other departments of the government. Joint committees of congress, with the aid of experts, have investigated and reported on this situation but without appreciable effect. The most recent example is that of ex-President Taft's efficiency and economy commission. Despite its findings that from 10 to 50 per cent.—from one hundred to five hundred millions—of all government expenditures could be saved by the adoption of up-to-date methods, the committee's report has been consigned to the pigeon holes, where dust accumulates on its recommendations. In February, 1908, a joint congressional commission appointed to investigate the business methods of the post office department, of which the Hon. John A. Moon, present chairman of the house committee on post offices and post roads, was a member, pointed out that:

> Past experience has disclosed the lack of such a central system of accounts in the post office department as rendered the determination of the cost, profit or loss in connection with a given line of service impracticable. For more than 100 years the great and stupendous business of the post office department has been operated without being overhauled or looked into from the standpoint of critical expert scrutiny of its business methods.

And further it states:

> Congress has not at any time, been able to secure from the post office department or the officials thereof an accurate statement of the sources of profit and loss, so as to show wherein remedial legislation could be enacted so as to prevent waste without interfering with the harmonious conduct of the postal system.

And in language somewhat stronger, the recent report of the joint congressional committee on railway mail pay, already

referred to, comments with reference to the same aspect of the question:

Notwithstanding these numerous concrete instances of departmental vacillation, and its lack of comprehension of the essentials of successful business operations, we are confronted with the fact that the present postmaster general and his predecessor have each furnished an illustration of the greed for additional power innate in humanity by advocation of government ownership and operation, under the post office department, of the telephone and telegraph systems of this country.

The necessity of going to outside sources for ultimate verification and also the labor in testing the accuracy of departmental statistics has very greatly delayed the work of this committee. While it is an injury to the pride of an American citizen to know that the most important of our governmental institutions is so utterly lacking in knowledge of its own business affairs, as this record has disclosed, we believe it is a duty we owe to the country, to congress, and to ourselves to state these facts in order that others may not be misled by assuming that departmental statistics are reliable.

With reference to the bookkeeping method of the post office department, the accountants' report to the committee of congress was as follows:

The books are kept on a single entry basis on the most antiquated lines; debits are made at one time and from one source and the corresponding credits at another time and from another source. Many of the subsidiary books which form part of the bookkeeping system are not added, and owing to the lack of proper system of balancing by totals and other deficiencies, irregularities could be practiced indefinitely without the fact becoming apparent from the general books.

There is practically no agreement whatever between the revenues and expenditures as shown by the general books and the actual cash received and disbursed in any year as shown by the records kept in the division of finance.

The post office department could not obtain a license to do business in Ohio under our "Blue Sky" laws.

I call the attention of this convention to the conclusion of the committee of the railway commissioners after having had the consideration of this subject before it for a year. It is as follows:

When we consider, therefore, how intimately the public welfare is bound up with an adequate development of our wire service, and the deplorable consequences—from the standpoint of extent, quality and cost of service—which have followed attempts of foreign countries to develop their wire systems by direct governmental agency; when we consider, too, that this unfortunate condition has come about despite an acknowledged superiority in point of administrative efficiency of foreign governmental machinery over our own; when we consider finally, that an analysis of the causes underlying the strikingly inadequate character of the wire service abroad reveals governmental defects inherent in direct governmental management, but fortunately absent under a system of governmental regulation—it would seem that, until such time as evidence to the contrary is adduced of a more conclusive character than that presented by the postmaster-general and his assistants, it is preferable that the government in this country continue in its policy of dealing with electrical systems of communication as regulated monopoly.

It is unfortunate that the whole of this report can not be placed in the hands of every voter in the United States. This committee has delved into congressional records and many committee reports made to congress. Few people read the congressional records or have access to these reports. The newspapers in the country do not print such information.

We are not alone in our fight against municipal and government ownership of utilities. Great Britain has raised her voice against it. Municipal trading, as they call it in that country, has gained a much stronger foothold than in this, and their experience should be a timely warning to us.

That country has invested in waterworks, $602,795,000 (£120,559,000); in gas work, $117,755,000 (£23,551,000); in electrical works, $141,090,000 (£28,218,000); in tramways and light, $154,444,000 (£30,888,000); in harbors, etc., $227,050,000 (£45,410,000); in markets, $38,270,000 (£7,654,000). This makes a total of $1,281,400,000 (£256,280,000).

The liabilities on account of these trading undertakings are:
England and Wales 55 per cent. of total debt.
Scotland 66 per cent. of total debt.
Ireland 67 per cent. of total debt.

In England and Wales there was a profit of	$429,670	(£85,934)		
In Scotland there was a loss of			$301,725	(£ 60,345)
In Ireland there was a loss of			$373,960	(£ 74,792)
	$429,670	(£85,934)	$675,685	(£135,137)

There was, therefore, a net loss of $246,015 (£49,203).

Since the above figures were furnished in 1913, the telephone system of the United Kingdom has been taken over by the government or post office department, and in consequence the losses have greatly increased, and will have to be made up by taxation of the people. Indeed, the loss to the people in 1913 was over $6,000,000.

One cannot help being astonished at the amazing ignorance of some of the principal advocates of government ownership in regard to the present state of our great telephone systems. Congressman Lewis, who is the high priest and chief advocate, expresses the belief that the development of the telephone in private, has reached its limit. Yet in 1914 there were over 700,000 telephone stations added to the systems in the United States. This is on a par with a statement of a patent office official in 1833, who sent in his resignation and assigned as a reason that inventions were all made that would be, and the patent office would soon be abolished as useless. Yet since that time over a million patents have been issued.

Many of the leading politicians seem to be unable to grasp the magnitude and perfection of our telephone systems. A short time ago the head of the army and navy department at Washington asked the leading telephone and telegraph companies how long it would take and what it would cost to connect by wire all of the forts and principal harbors of the United States with the war department at Washington. The answer was:

"We are already connected and it will require five minutes to send a message from Washington to each of these points. In time of danger or war it will not cost the government one cent."

Is there any government in the world that can show such an efficient system of communication?

Daniel Webster, in speaking of the power and greatness of England, said: "Whose morning drum-beat following the sun, and keeping company with the hours, circles the earth with one continuous and unbroken strain of martial airs." We do not boast of our military prowess but of our love for peaceful achievements. And when peace is proclaimed by the warring nations of Europe, the news will be taken up on the shores of the Atlantic and 9,000,000 telephone bells will ring out and carry the glad tidings to 100,000,000 sons of freedom—"Peace on earth, good will toward men."

References.

(1) Report of the joint committee on postage and second class mail matter and compensation for transportation of mail, August 31, 1914, 63rd congress, second session, House Document No. 1155, page 112.

(2) Preliminary report of the joint commission on business methods of the post office department and postal service. Report of the 60th congress, first session, Senate Report No. 201, page 1.

(3) Idem, page 2.

(4) See above House Document No. 1155, pages 115 and 116.

(5) Address of T. P. Sylvan before Richmond Telephone Society—Telephone Engineer, April, 1914, page 181.

(6) Report of committee on telephone and telegraph rates and service of National Association of Railway Commissioners, October 12-15, 1915.

Practical Subjects—Letters and Discussions

Damage Done to Rural Lines by Sleet Storm.

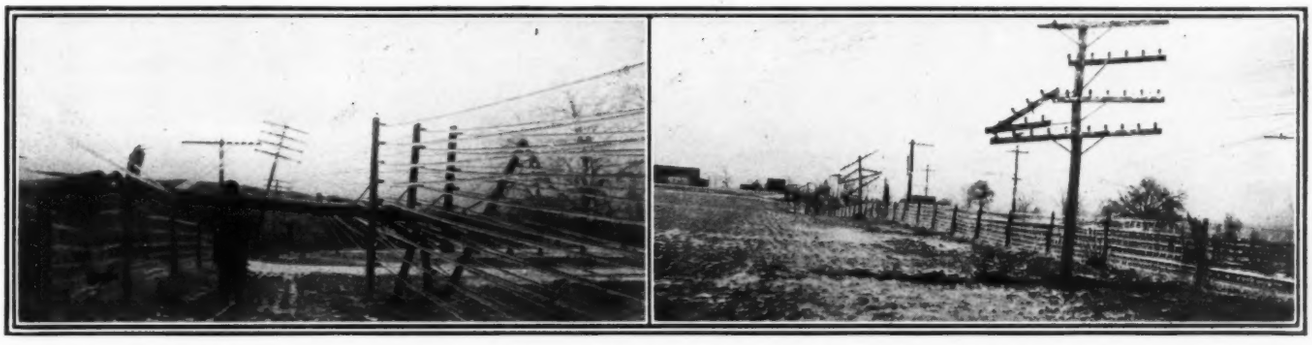
The accompanying illustrations show some of the damage done to our lines by a recent sleet storm, in this section of the country. In the break shown eight poles were snapped off, but the lines continued to give service the wires being heavily coated with ice—an inch in diameter—which acted as an insulator. Not one wire on this 40-wire lead was broken, which shows the strength of No. 12 iron wire.

We secured permission from the farmers to erect the broken poles in their fields. By doing this and patching up the cross arms, we were able to restore service in a very short time. This was the worst storm that I have experienced in my 17 years in the telephone business.

In this locality we have a great many rural companies, both Bell and Independent. The Enterprise Telephone & Telegraph Co., had only five poles standing out of 125 poles. This was a five-arm lead and was a well built line.

The lines of the following rural companies were damaged by this storm: The Scheafferstown Rural Telephone & Telegraph Co., the Mastersonville Rural Telephone Co., the Intercourse Rural Telephone & Telegraph Co., the Conestoga Rural Telephone Co., and also some lines of the Bell company. It will probably be a long time before service will be restored to normal.

C. B. Eaby, Manager,
Ephrata, Pa. Denver & Ephrata Tel. & Tel. Co.



Effect of Sleet Storm Upon Lines of the Denver & Ephrata T. & T. Co., Ephrata, Pa.—Wires Remained Intact.

An Old Kansas Switchboard.

The last of December, at Ottawa, Kan., there was discarded one of the oldest telephone switchboards then giving service in the country. The oldest section of this board was installed in the spring of 1898. Service was commenced on June 13 of that year and has continued without interruption night and day, during storms and floods and fires in adjoining buildings, until last month—except for one hour during President McKinley's funeral, when all business of the town was stopped out of respect for the martyred president.

Some of the first news of public interest which it handled was the report of Admiral Dewey's victory at Manila Bay, which occurred about three weeks after the board was installed. And during these 17½ years it has carried the messages of sorrow, joy and love, birth and death, floods and fire, defeat and success for a busy community of from 7,000 to 10,000 people.

The Missouri & Kansas Telephone Co. had been giving service in Ottawa for about 14 years previous to the time this board was installed. Its bid for the patronage of the public had been successful to the extent that it had at this time about 45 telephones in service for which it charged from $3 to $5 per month, with a rate somewhat lower for party lines.

The writer remembers a calendar issued by a local printer which showed in one column a list of the fire alarm boxes and in a parallel column a list of telephone numbers, both columns being about the same length.

The members of the new company, J. E. Byers, of Ottawa, and Joe Carey and Frank Brown, of Garnett, Kan., judging from the number of subscribers the Bell company had, concluded that a 200-line section would be sufficient for some years and so bought one of that capacity with 150 drops installed. It will be remembered that this was at the very start of the Independent movement in Kansas. As there were only four or five Independent exchanges in the state at that time, and they were but a few months old, the only experience upon which to base an estimate was that of the Bell company.

The first section of board was full in about three months and about 400 telephones were in service at the end of a year. The writer recalls that his wife, who was the first operator, and he, himself, were engaged with the understanding that $1 was to be added to their salary for each 20 new subscribers they were able to get, and that at the end of the first year their salary was much better than their employers had intended or that they had hoped for.

The telephones which were at first installed were assembled at Ottawa, having Holtzer-Cabot generators and boxes, walnut backboards with room for two Laclede (sal ammoniac) cells, 250-ohm coils and transmitters built on the ground having a carbon back, carbon diaphragm and six carbon balls about 3/16 of an inch in diameter, instead of the granular carbon now used. These transmitters, of which the writer built about 800, were quite natural in tone and would carry a whisper, but lacked the volume of later transmitters.

The board itself was equipped with 500-ohm induction coils. Later, when manufacturers began to offer cast iron transmitter arms for sale, they were careful to state that the coil was of 500 ohms and some even used 750-ohm induction coils.

It was the duty of the installers, at that time, to instruct the new subscriber how to use a telephone, as most of them had never used one before.

In engaging operators an effort was made to get operators who had been accustomed to using a telephone in their homes, but sometimes applicants had never even talked over a telephone.

On one occasion the men had installed a telephone, and after instructing the subscriber in its use left the house. A short time later a drop on the switchboard fell and the operator, upon answering, heard a woman's voice over the line say to some one in the room, "It says 'number'."

The operator then said, "hello," thinking that the subscriber

did not know what was meant by number, and she heard the voice say, "It's saying 'hello,' now." It made the operator very angry to be thus referred to as "it."

The first outside cables were made on the ground, of No. 20 annunciator wire. The wires were roughly twisted in pairs by hand and thoroughly saturated with pine tar and covered with two or three wrappings of friction tape two inches wide and, I believe, with each wrapping painted. The longest of these, which was 395 feet long, contained 110 wires and is still in use. Lead cables were later strung over the same route, but each time proved insufficient for the growing business so that the old "rag" cable has never been entirely discarded.

The exchange was engineered by and built under the supervision of A. S. Munsell who, the previous summer, had built the plants at Iola and Garnett and later built the one at Atchison in 1899. While at Ottawa, Mr. Munsell secured a franchise at a neighboring town of about 3,000 population and crammed it in his pocket for a long time, unable to get any one to accept it and build a system in the town.

The switchboard was made for and sold by the Electric Appliance Co., of Chicago, and was designed by S. E. Dinsmore, whom, if he is living, the writer would like to hear from. It was of the single conductor or common return type, which was the kind of service given, even in cities the size of Kansas City at that time. The drops are very substantial with iron encased coils of 250 ohms' resistance and are mounted on fiber strips in banks of five.

The jacks are also on fiber strips, a hole in the strip serving as an opening for the plug. This has proved to be an excellent material for the purpose, as none of the strips have ever been renewed. The jack comprises three springs, one being wired to the line, a cut-off spring being wired to the drop and a short spring to the operator's set.

There was a difference of one-fourth inch in length between the front and back plugs. When the long plug was inserted fully into the jack it made a contact with both the line and operators' springs, thus connecting the operator with the line. When the plug was pulled back about half an inch, the line spring dropped into a groove on the end of the plug. In this position the operator was not connected to the line.

The key is a simple strap key used only for ringing and one side of each drop and operator's set it is connected permanently to ground. The original plugs were worn out many years ago and were replaced with a plug of our own make, without any loose or movable parts, which has proved very serviceable. As the board was extended, it became necessary to arrange a trunking system. This was done by means of a plug and jack transfer without any supervision, except attention from the operator, and a simple order key was used to communicate with the distant operator.

A time came when the board was no longer manufactured and the jigs and patterns could not be found. Then second-hand boards of that make were bought as needed and overhauled. In one instance an old standard electric board, which had similar drop shutters, was used until finally no more boards could be had. A 100-drop section was then built outright, except for the Stromberg-Carlson drops which were used.

The cabinet was built in the local planing mill and the jacks were made from fiber strips and German silver sheets. The board had, at the time it was discarded, 1,600 lines' capacity and was serving about 2,100 subscribers. The board would have been discarded years ago but for the fact that the company was originally granted a 21-year franchise limiting its rates to $1 and $2. And while the public was very free to criticize the poor service, which was the best that could be given with the old board, it was not willing to consent to a higher rate which would justify modern equipment until the last summer.

The company met with strong opposition from the Bell company during all of its existence—except for the last four or five years—which included the giving of free common battery service, making the usual false statements by unscrupulous solicitors and the like. The service given, though very faulty, however, proved good enough to meet Bell competition, that company having not more than about one-fourth the number of subscribers of the Independent exchange at any time.

The writer feels unable to pay suitable tribute to the operators, many of whom have passed away, and several of whom remained with the company 10 years. They passed the weary hours so faithfully at the old switchboard, came to work on horseback when the snow lay so deep that hacks could no longer get through and came across the river in boats during a flood, at the risk of their lives, to help their over-burdened companions who were on duty. Always criticised by the public for poor service which was the fault of the apparatus and not their own, surely in the day of final accounts there will be a balance to their credit.

As previously stated, the exchange was first built by Joe Carey, of Garnett, who is still in the telephone business; Frank Brown, of Garnett, who, at the time of his death several years ago, was president of the companies operating in Emporia and Wichita; and J. E. Byers, of Ottawa, now retired.

The exchange was sold by them to the Kansas City Long Distance Telephone Co. in 1905 and was lately sold, together with the competing Bell exchange, to W. P. Hemphill, formerly manager of the Topeka Independent Telephone Co. The consolidation of the two exchanges has practically been completed, under the name of the Kansas Telephone Co. A multiple common battery switchboard has been installed and the outside construction rebuilt and cables placed underground.

Bonner Springs, Kan. U. S. Hannum.

One Cause of "Wrong Number" Complaints.

A subscriber of the Main exchange in Memphis, Tenn., according to the Southern Telephone News, was calling Hemlock 1428. Twice, when the called party answered, a coarse feminine voice stated her number was 229. The calling subscriber was irritated, and finally called the Hemlock chief operator and reported gross carelessness and incompetency on the part of the operators. The chief operator, having learned his wants, personally rang Hemlock 1428 and established the connection, staying on the line long enough to hear the called party again report that her number was 229.

The calling subscriber hung up in disgust, but the chief operator quickly grasped the situation and realized that the person answering was a negro woman, who, through ignorance was giving as her number that shown on the metal number plate attached to the bottom of the transmitter. The chief operator called the calling subscriber and established the connection, explaining to him the trouble. She stayed on the line and heard the following conversation:

"Is this Hemlock 1428?"

"Naw, sir, dis is 229."

"What place is this?"

"Dis is Mr. Jones' residence, but there ain't nobody here but me."

"Well, who are you?"

"I'se de cook."

"What kind of a cook are you?"

"I'se a right good cook."

"Well, I hope you can cook better than you answer a telephone."

He then hung up. The thoughtfulness of the Hemlock chief operator, Miss Bessie Howell, made a friend for the company of a subscriber who, through no fault of his or the company, was irritated by the ignorance of one of a class with whom the Southern telephone companies constantly deal.

"Safety First" Between Telephone and Power Wires

Discussions Created by Rules Regarding Plant Construction and Conditions of Power Plant Operation—Fundamental Principle Should be the Personal Safetyof Individual—Instances Illustrating What California Rules Are Intended to Prevent

By F. W. Tenney

For a considerable period of time it has been customary for both public and press to expatiate greatly on the universal benefits to be derived from the observance of such rules of conduct and procedure as may be based on the principle of "Safety First." In fact, it has become almost a rarity to find a periodical which does not emphasize this principle to its readers at frequent intervals. The principle has been adopted by countless numbers of employers, employes, and also people in their daily life, in an attempt to improve some of the conditions which have resulted in an appalling number of accidents, many of which might have been obviated by the mere thought of "Safety First"; that is, if the thought occurs at the proper time, which is not always the case.

Application of "Safety First" to Utilities.

In an application of this principle to the practical affairs regarding public utility companies, we find, for more important cases, various rules regarding plant construction, and conditions of power plant operation, as issued by various state bodies to the corporations under their control. In California, state laws regarding pole line and underground construction have been in effect for a number of years. These rules were largely based on the hazard to the employe at his work. Later, the California Railroad Commission issued general order No. 26. This refers largely to clearance between wires of different voltages and various wires and railroads and highways at crossings, thus tending to safeguard the public and the employe of all companies.

During the past summer, general order No. 39 was issued, which requires greater clearances between parallel signal and power circuits, when the power circuits are energized to 5,000 or more volts above the earth potential. It also prescribes rules for operations with special reference to abnormal line conditions. This last order was the outcome of the investigation which is being pursued, following the formal complaint of the Pacific Telephone & Telegraph Co., to the railroad commission regarding certain cases of inductive disturbances from which they were suffering. A committee, upon which the power interests, the signal interests, and the railroad commission were equally represented, was formed, and performed much research work in the field with a well equipped laboratory.

A formal progress report was made by this committee regarding the work to date, which covered a period of many months, and immediately thereafter this general order No. 39 was issued. This specific ruling had special reference to inductive disturbances, and was retroactive by complaint to the commission in extreme cases. Yet the full observance of the rule regarding operation with defective power wire is of special efficacy in the reduction of the physical hazard which is extreme, when dangling wires reach the wires of other systems or a public thoroughfare.

In all rules which may be issued for standards of construction or operation, the fundamental principle should be the personal safety of the individual, and all other considerations made subordinate thereto. When this principle is strictly applied to rules regarding the clearances between high and low voltage circuits, and regarding the operation of power system of high voltage, or of any power system under abnormal conditions, it will be true that inductive interferences will be very largely eliminated by the methods adopted to reduce the physical hazard.

Shortly after the issuance of this general order, a paper was presented before the American Institute of Electrical Engineers, at Spokane, which embodied the work of the investigating committee. This report showed the results of months of experimental work, and in its technical claims has been questioned to only an extremely limited degree. It cannot be said, however, that the report, or the subsequent ruling, has been free from complaint, for the criticisms against circuit clearances, transpositions and circuit shut-downs for defective power wires, have been vitrolic to an extreme at times.

In a recent issue of The Electrical Review, an article appeared giving a digest of the discussion of the proposed rules of construction and operation to be adopted by the Wisconsin Railroad Commission. The rules for operation were stated to be practically the same as the California general order No. 39, and the criticism was again extremely strong against such unreasonable (?) rulings. It is only fair to state right here, however, that these caustic criticisms have all come from sources which are not under the supervision of the California Railroad Commission.

Having seen no discussions published wherein actual cases of trouble which have occurred in the recent past and which would have been avoided under these new rulings, it would seem that such a demonstration would be timely. This is more especially true as attempts are being made to pass all such questions up to the United States Bureau of Standards for federal recommendations and the strongest critics have uniformly stated their intention so far as might be in their power, relative to any similar rules being passed in the states wherein their corporate interests are located.

Comments on the Spokane meeting, which are worthy of attention, claimed that it was a matter of no concern to a power company whether a transmission line gave trouble to a parallel signal line or not, as it was necessary to maintain the power lines. In this assumption, the critics are not willing to concede any weight to be given to priority of occupation of a given route—for few signaling lines have been built in close proximity to an existing high tension line—nor is even common business courtesy shown.

The Burden of Providing Protection.

If this phase of the matter were called before the Bureau of Standards, with the entire case, the bureau might, with great propriety refer one to its technological papers, No. 27. On page 18 is the following statement on electrolysis studies, by E. B. Rosa and Burton McCollum, respectively chief and associated physicists of the Bureau of Standards: " . . . . This is the more emphasized by the fact that in the past where such mitigating measures have been applied to the pipes, the burden of providing the protection has usually fallen where it does not properly belong, namely, on the injured party. . . . ." This was in reference to underground disturbances between utility concerns, in place of, as in the present case, an aerial disturbance.

The California rule prohibiting the operation of a power line with an open, grounded or short-circuited wire or wires has been very roundly condemned. One prominent engineer at the Wisconsin hearing claimed that in many cases the continuity of the power service was of more importance than the small amount of disturbance caused to the telephone lines. A recent case in California will show what the results may be if this engineer attains his wishes in such cases.

A 10,000-volt wire on a branch line burned off its cross arm after an insulator failure, and burned itself into the pole. For several hours the power men searched for this defect. During the time the search was in progress, this 10,000-volt wire, which was continuously energized, kept swinging at very frequent intervals (perhaps every two or three minutes, at times) into direct physical contact with some of the toll telephone wires.

This intermittent swing, which extended over a period of hours, caused the property damage to be extended for nearly 150 miles. Equipment was destroyed more than 100 miles from the point of contact, and damage occurred in ten different offices and sub-offices. Of greater importance than the property damage, however, was the deadly menace which this circuit, supposedly a harmless telephone wire, carried into towns and over and along highways for nearly 150 miles.

Such a condition as this is one which the California Railroad Commission has ruled shall not exist. The critics, on the other hand, claim such prohibition of operation to be an unreasonable restriction. Which is right? Such cases are not by any means as rare as might be expected.

This general order also requires all power plants to maintain their load balanced as far as possible between phases, and instrumental means for determining such current balance to be maintained at all attended power stations. Air switches for new work are prohibited other than as disconnecting switches.

Telephone Lines Affected by Open Air Switch.

On another occasion a case of trouble occurred on another of the toll leads. It lasted about two days, and has a direct reference to the foregoing rules. "No power lines were out of service," yet all the toll lines for a matter of about 200 miles were hardly usable. The telephone men failed to find the cause of the disturbance, but on the afternoon of the second day a power line patrolman discovered an air switch had opened by the blade falling out at the end of a branch line ten or twenty miles from the telephone lines so badly affected.

Owing to the lack of meters at this transformer substation, the operator had no means of knowing that a circuit having one open phase was being fed from that station. If interlocked oil switches had been in use, this case would never have occurred. Also the maintaining of this particular parallel at a distance of 50 or more feet at all places would have given much relief, yet for miles and miles, a 12-foot clearance from this high tension line was all the clearance the constructing engineer for the power company would grant to the existing toll lead.

An even more flagrant case of disturbance, due to an open phase wire, is reported from San Francisco, where the trouble was in existence for eight days in succession, due to an open air switch, and was continuous in its disastrous results on many lines.

The trouble due to a dangling power wire, which remains energized, is not an extremely rare case, either. But until the power station attendants are able to see whether any defective wire is dangling in the air at some place where it may come in contact with some other wire which is for public use, or may come in actual contact with individuals passing, no one can deny the extreme physical hazard which exists. And this hazard is of more importance than the continuity of service on the line which creates the hazard.

Much criticism has been directed to the adoption of 5,000 volts as the lower limit of the restricted class, yet in Wisconsin, claims were made that the value was too low, while others claimed the limit was too high. If the fullest consideration was given to public safety, would the value be higher or lower, when considering such cases of dangling wires with which we all have been familiar?

It is also claimed that the enforcing of the transposition requirements would have a tendency to weaken the line and create a large expense which possibly would be of no benefit. It would hardly be expected that any commission would authorize the compulsory enforcement of this provision unless the complaining signal company was able to satisfactorily show that definite results would be reasonably sure to follow certain assumed remedial measures.

It is a well known fact that the average individual would not be able to transact his business with any comfort or certainty over many of the lines which are maintained by power systems for dispatching purposes. Many power engineers have realized that the changes by the telephone companies would also be beneficial to their own telephone lines. In consequence, some of these very "vicious" rules were adopted by some of the California power men at a considerably earlier date than the issuance of this much maligned ruling.

Much credit is due to the members of the investigating committee formed at the request of the California Railroad Commission, and who have devoted much time, thought and energy to this most important subject. The power men on this committee may have modified their original views on these subjects or they may have at all times been more fairly disposed to the rights of the communication interests than are these critics. The latter evidently do not realize that this committee contained equal representation of power and signaling interests, and that the ruling was the result of a unanimously adopted report. In place of, as was stated at the time of the Spokane meeting, being a "deal slipped over on the power companies" it was a report based on months of study, experimentation and discussion, which was concurred in by all members of what was truly the Joint Committee on Inductive Interference.

Telephone Owners' Conference at Minneapolis, Minn.

Announcements have been sent out by the Telephone Owners' Conference Committee of a conference on valuation and uniform accounting to be held on Monday, January 24, at the West Hotel, Minneapolis, Minn. The general question for the entire conference is: "What are the most important facts, and how shall they be used to bring about the greatest good for the greatest number." The morning session will begin at 10 a. m. sharp and the afternoon session at 2 p. m. The following tentative program has been drawn up:

Morning Session.

Free Parliament and Question Box.

An opportunity will be given for every one to tell of the thing he considers most important concerning valuation; and to submit questions.

The questions must be reduced to writing. They should be mailed to the committee headquarters, Room 500, West Hotel, Minneapolis, as many days in advance as possible.

A list of important questions will be printed and placed in the hands of each person attending, as soon as he arrives. In this way it is believed that better results will be secured.

"First Actual Experience in Minnesota—Valuing the

Long Prairie Exchange," by Joseph Kraker, Long Prairie, Minn.

Additional comments on this case have been requested from Mr. Howell, telephone expert of the Minnesota Railroad & Warehouse Commission.

"A Brief History of Valuation and Uniform Accounting Progress in Minnesota." The Minnesota Independent Telephone Association has been requested to appoint a representative to speak on this division of the general subject.

"What the Telephone Owners' Conference Committee is Trying to Do About the Valuation of Their Properties," by a representative of the Telephone Owners' Conference Committee.

AFTERNOON SESSION.

"The Best Help from Science—For Telephone Valuation." The University of Minnesota has been requested to appoint a representative to speak on this subject.

"The Best Help from Our Schools—for Telephone Valuation." The president of the Minnesota Educational Association has been requested to speak or appoint a representative to speak on this subject.

"Co-operation of Telephone Owners, Scientists and Teachers—For the Best Results—In Telephone Valuation Work." Harry N. Merrill, secretary of the Hutchinson (Minn.) Telephone Co. and late president of the Minnesota Educational Association.

"Co-operation of Telephone Owners and Churches—For the Encouragement of Correct Sentiment Regarding Telephone Valuation." Representatives of Catholic and Protestant churches have been requested to speak.

"Co-operation of Telephone Owners and the Owners of Newspapers—For the Best Results in Telephone Valuation." The Minnesota Editorial Association has been requested to have a representative speak on this topic.

"Co-operation of Telephone Owners and the State Commissions—For Securing the Greatest Good for the Greatest Number." The Minnesota Railroad & Warehouse Commission has been requested to appoint a representative to speak.

"Co-operation of Telephone Owners and the Interstate Commerce Commission." The Interstate Commerce Commission has been requested to appoint a representative to speak or send a communication to be read.

"Co-operation of State Telephone Associations—For Best Valuation," by representatives from the various states.

"Co-operation of Telephone Owners and the National Association." The United States Independent Telephone Association has been asked to appoint a representative to speak.

"Co-operation of Telephone Owners and the Bell." The Bell company has been requested to appoint a representative to speak.

"Co-operation of Telephone Owners and the Railroads." The Railroad Presidents' Conference Committee has been requested to appoint a representative to speak.

"Co-operation of the Telephone Owners and the Telegrahs." Both the Western Union and the Postal Telegraph companies have been requested to send representatives to speak.

Jas. P. Keane, secretary of the Telephone Owners' Conference Committee, invites and urges every telephone manager throughout the Upper Mississippi Valley, and every telephone owner more especially, to attend and take an active part in the conference on January 24. This time was chosen to avoid double expense for those expecting to attend the convention of the Minnesota Independent Telephone Association on January 25 and 26.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies, Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchises, Rates and Service

Agreement in Fort Dodge, Iowa, Franchise Controversy.

At a meeting held last week, the city council of Fort Dodge, Iowa, signed the stipulation in settlement of the case to enforce the observance of the franchise granted the Fort Dodge Telephone Co. in 1898. The attorney for the telephone company stated that the officials of the company would sign the stipulation as soon as it was presented to them.

According to the stipulation agreed upon, the district court will appoint two disinterested telephone experts or construction engineers, in case a petition is filed either by the telephone company for an increase in rates, or a petition signed by 100 patrons of the company is filed asking a decrease. These two experts will appraise the company's plant as a basis for fixing rates and, if unable to agree, shall select a third expert to work with them. Such appraisal shall not be made oftener than once in three years and not before January 1, 1917. The telephone company agrees not to raise the rates before January 1, 1919.

The stipulation also contains the following clause:

"In case the general assembly shall at any time enact legislation providing for the manner of fixing rates to be charged by telephone companies, the provisions herein contained for fixing rates by arbitration shall be abrogated."

The Fort Dodge Telephone Co. purchased the local plant of the Bell company a number of years ago and claimed to be operating under the Bell franchise. The supreme court's ruling in the Des Moines case held the Bell company had gained rights prior to the law of 1879 regulating the granting of public utility franchises.

The city has been trying to keep the company from raising rates in violation of the ordinance of 1898. The company maintained it could not pay a reasonable interest on the money invested at the old rates.

Work of installing telephones has already been begun by the Fort Dodge company and as fast as equipment can be installed, the applicants—nearly 700 in all—will be furnished telephone service. The company has at the present time about 3,650 telephones in service and General Manager J. M. Plaister estimates that this number will be increased to 4,500 within a year.

Valuation of Pacific Company in California.

The California Railroad Commission has announced its intention of making a physical appraisal of the Pacific Telephone & Telegraph Co.'s property throughout the state. The commission will also make an exhaustive examination of the company's books for the purpose of securing a basis from which to figure rates for the entire state.

This action is the result of a petition filed by the Pacific company asking that the commission take the valuation of its entire system for California in making rates, and not fix the rates by appraisal of the investment in the

community affected by the rate. It also asked that certain exchanges be placed in certain classes and that rates be fixed by classes rather than by individual municipalities.

Abilene, Texas, Company in Temporary Receivership.

C. A. Boulte has been named as temporary receiver of the Abilene Independent Telephone & Telegraph Co. by Judge T. L. Blanton of the district court at Abilene, Texas. The receivership was asked for by the Southwestern Telegraph & Telephone Co. with which the Abilene company was consolidated several months ago. The property is valued at $875,000.

The permanency of the receivership will be determined before the court January 24.

Suit to Test Validity of Rate Increase at Woodburn, Ore.

Suit to restrain the Western Telephone Co. from putting into effect increased rates recently fixed by the Oregon Public Service Commission, has been instituted in the circuit court at Salem, Ore., by the city of Woodburn. The attorneys for the city contend that the company's rates are fixed by the franchise, and that the commission was powerless to increase them.

Summary of State Commission Hearings and Rulings.

ILLINOIS.

January 6: Petition for approval of agreement between receivers of the Central Union Telephone Co. and the Kewanee Home Telephone Co., for the sale of the Kewanee exchange of the Central Union company to the Kewanee Home Telephone Co., for $9,000 and the consolidation of the plants, approved.

January 6: Certificate of convenience and necessity granted the Stronghurst Telephone Co. to construct a toll line from Stronghurst to Lomax.

January 6: Petition for approval of agreement between the receivers of the Central Union Telephone Co. and the re-organization committee of the Western Illinois Telephone & Telegraph Co., of Macomb, to operate their lines in connection with each other, granted.

January 6: Petition of Central Illinois Light Co. to remove its 60-kilowatt transformers from its line paralleling the Fairview Central Telephone Co., in Fulton county, denied because the company lines use non-metallic conductors and it is held that the current from the high tension wire would interfere with the service of the telephone company.

January 10: Hearing on complaint of the Waverly Telephone Co. vs. the Chesterfield Telephone & Telegraph Co., for refusal of defendant company to receive and transmit messages at its Chesterfield exchange which originate on lines of complainant company and also as to the division of toll revenue, etc.

INDIANA.

January 4: Complaint filed by the Martinsville Chamber of Commerce against the service of the Martinsville Telephone Co., of Martinsville, Ind.

KANSAS.

February 10: Hearing on application of the American Independent Telephone Co., of Holton, Kan., for permission to abrogate certain contracts and to discontinue free service with certain exchanges.

MICHIGAN.

January 12: Continued hearing on application of the Michigan State Telephone Co. for permission to put its service on a metered and flat rate basis in Detroit.

MISSOURI.

January 22: Continued hearing in the matter of the application of the Kansas City Southern Railway Co., asking that the commission adopt uniform rules and regulations governing the construction of telephone, telegraph and other electrical signaling wires over the tracks and rights of way of railroad companies in the state. A committee has been appointed, composed of members of the different wire-using companies, with Commissioner Howard B. Shaw, as chairman, to secure data and draft a set of proposed specifications for the instructions.

NEBRASKA.

January: Petition filed by the Lincoln Telephone & Telegraph Co. for permission to increase its rates at DeWitt, Neb. The Lincoln company alleges that its operations at DeWitt, the past year, resulted in a loss of $1,000.

January 4: Hearing on application of the Gothenburg (Neb.) Telephone Exchange for permission to increase its farm line switching rate from 25 to 50 cents per month.

January 5: Hearing on application of the Lincoln Telephone & Telegraph Co. for permission to increase its farm line switching rate at Syracuse from 30 to 50 cents per month.

January 6: Hearing on application of the Glenville Telephone Co. for permission to establish a ten-cent toll rate applicable to non-subscribers for service between Blue Hill and Pauline.

NEW YORK.

December: The commission authorized the Perry Telephone Co., of Perry, N. Y., to issue $39,500 of its 5 per cent., 20-year, first mortgage bonds secured by a mortgage of like amount to the Trust Co. of Warsaw, N. Y., as trustee. The proceeds of the bonds will be used to take up an issue of $30,000 of first mortgage bonds now due, and to retire demand notes of the telephone company of $2,000 and $5,000 to the Citizens' Bank of Perry and $2,500 to Abram Reese.

January 4: Hearing of complaint of Paul Smith's Hotel Co. against the Mountain Home Telephone Co., of Plattsburg, N. Y., as to service charge between lines of the hotel company and the telephone company.

January 4: Hearing in the matter of recommendations of the commission for improvement of the service of the Walton People's Telephone Co., of Walton, N. Y.

OHIO.

January 4: The commission extended the time limit for the filing of the inventory of the Ohio State Telephone Co., with headquarters at Columbus, Ohio, to July 1, following a statement by Rollo R. Stevens, general commercial superintendent, that recent storms had necessitated repairs and delayed the work.

January 27: Hearing of protest of the Lima Telephone & Telegraph Co., of Ohio, against the tentative valuation recently placed upon its plant by the commission. The company charges that the commission's experts in valuing the property 8 to 10 per cent. lower than did the company have undervalued certain factors that enter into the appraisement.

OKLAHOMA.

January 10: Continued hearing on the complaint of subscribers of the Pioneer Telephone & Telegraph Co. at Ardmore, Okla. At a previous hearing the commission gave the company 30 days within which to improve service before proceeding upon the complaint.

SOUTH DAKOTA.

January 12: Hearing on application of the Northwestern Telephone Exchange Co. for permission to establish a rate of $2.50 per month for long distance terminal service at Sioux Falls.

WASHINGTON.

January 24: Hearing on state-wide investigation of the Pacific Telephone & Telegraph Co. with a view to determining the reasonableness of the company's rates, both local and long distance. At this hearing the figures obtained by the commission's field engineers during the past year will be used together with the company's figures, in an effort to determine the fair value of the plant.

WISCONSIN.

December: The commission denied the petition of the Frederic Rural Telephone Co. for authority to establish a competitive exchange at Frederic, Wis. In denying the application the commission noted that the lines for which switching service is furnished by the Tri-State Telephone & Telegraph Co., of St. Paul, Minn., are heavily overloaded and kept in poor repair, and that, therefore, all of the defects of service are not chargeable to that company, as alleged by the petitioners.

January 4: Hearing in re application of the New Cashton Telephone Co., of Cashton, Wis., for authority to increase rates. U.—803.

January 5: Hearing in re investigation, on motion of the commission, of the rates and rules for switching service by the Hawkins Creek Telephone Co. and the Westford Telephone Co. U.—866.

January 19: Hearing in re application of the Watertown (Wis.) Telephone Co. for authority to increase rates. U.—826.

January 21: Hearing in re investigation of alleged refusal of the Marshfield (Wis.) Telephone Exchange or the Manville Telephone Co. to extend its lines for service to Wm. Riethers, et al. U.—869.

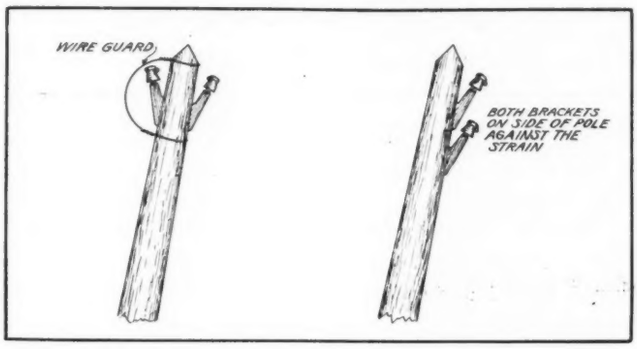
January 24: Hearing in re application of the Shell Lake (Wis.) Telephone Co. for authority to increase its rates. U.—867.

January 27: Hearing in re investigation, on motion of the commission, of the alleged inadequacy of equipment and service of the Ashland Home Telephone Co., of Ashland, Wis. U.—820.

Queries on Theory and Practice

Tying Wire on Bracket Lines.

In tying wire to glass on wooden pole brackets, which is best on straight lines: To tie to the side of the glass insulator farthest from the pole, to tie to the side of the insulator next to the pole, or to tie to the inside of the insulator on one pole, to the outside on the next and continuing in this manner—inside to outside to inside on alternate poles—to the end of the straight line? On reaching corner pole, is a wire guard as good as changing sides with bracket?



Proposed Methods of Tying Wire on Bracket Lines.

It is considered best to tie all glass insulators alike, namely, inside the glass. This is so that if a tie wire fails, or the glass breaks, the wire will fall into the angle between the pole and bracket and not sag down into other wires or into the way of traffic. On curves or corners, the wires should be tied so that the strain is against the insulator.

The zigzag method which you describe, has no serious objection except that it is not uniform.

We are very much of the opinion that the safest construction is none too safe. If at a corner both brackets are on the side of the pole away from the acute angle, any failure of glass, tie or bracket will tend to let the wire pull against the pole, and not swing down into the road. But if the wire guard is made of No. 9 or No. 10 wire, securely put on, it should be safe enough.

Dividing a Rural Line Circuit.

We have a grounded rural line from city A to a little town called B, five miles from A. We have 20 telephones on the line and want to run another line and divide the present one (Fig. 1). We were thinking about stringing another wire to B, using phantom coils and getting two grounded lines out of the one metallic line. How would we connect the telephones that are between A and B? What make of coils should we use? What would be your solution of it? Please let us know what would be the cheapest and at the same time the most satisfactory way of rebuilding the line.

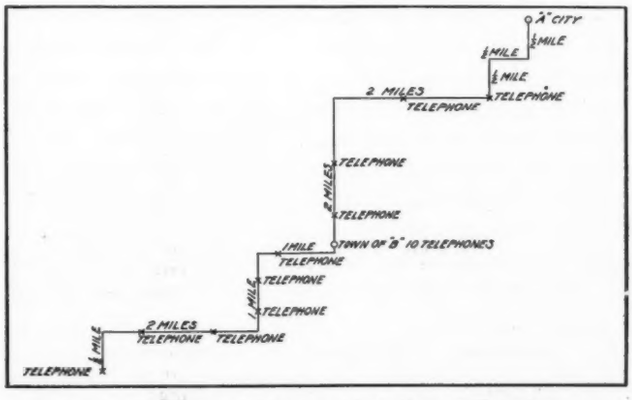


Fig. 1. Diagram of Line and Location of Telephones.

You can divide the circuit in two ways, as shown in Fig. 2. String the second wire as proposed and cut in a repeating coil at A. The center tap runs to the jack and drop for the earth return phantom; the other drop is for the metallic circuit. Install an impedance coil at B (half of a phantom repeating coil will do) and from its center tap extend the earth-return, phantom wire to pick up the six telephones beyond B. Now, if the ten telephones in town B can be divided, put four of them on the phantom (see Fig. 2-*A*) and the other six on the metallic circuits (6T). Bridge the four telephones between B and A on the metallic circuit. This gives ten telephones on each circuit.

If the ten telephones in B must be kept together, arrange them as in Fig. 2-*B*. Bridge all ten telephones (10T) on the metallic circuit. Put the four telephones between A and B onto the earth return phantom by means of impedances as indicated. The method of Fig. 2-*A* is better, as it involves fewer repeating coils.

Responsible Independent telephone manufacturers can supply suitable phantom repeating coils. Consult our advertisers and ask them for particulars.

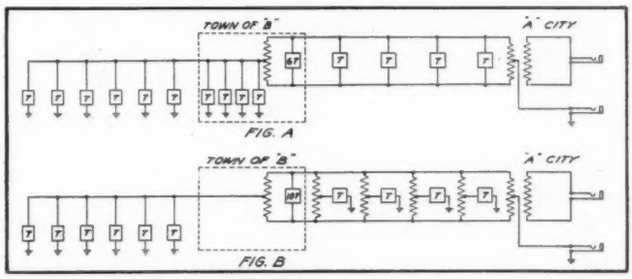


Fig. 2. Suggested Methods of Dividing the Circuit.

Trouble Due to Loose Bonds on Car Tracks.

We are operating a telephone system of grounded line circuits, magneto drop system, and are annoyed with the street car trolley kicking our drops when the car reaches certain points of the track. We are aware this is due to loose bonds on the street car tracks, but are not able to get the street car company to solder the bonds. We would like to know if there is anything we can do in the way of using higher wound drops, coils, or condensers in the circuits to avoid the trouble and still maintain the ground circuit.

High wound drops will not help you appreciably, for the higher the winding, the less current is needed to operate it because it has more turns of wire. A condenser in series with the drop may help you, if the fluctuations of trolley current are not too sudden. But a sudden fluctuation will kick through a condenser and knock the drop down anyway. Try a condenser as small as you can use and still receive rings from your subscribers.

Sometimes it pays to show the railroad company just where the bad joints are and that it is losing money by not having them properly bonded. A rail joint should have no more fall of potential than three feet of rail. Measure it by means of a low resistance milli-voltmeter while current is flowing in the rail. Bonding or metallic circuits are the only sure remedies.

New Toll Line of Southwestern Bell in Texas.

Work is progressing rapidly on the new toll line of the Southwestern company from Floydada to Plainview, Texas.

Fundamental Principles of the Telephone Business

A Reading Course Designed to Present Logically the Principles Which Underlie Successful Organization and Operation of Telephone Properties—Prepared Under the General Supervision of Stanley R. Edwards—Part I, Telephone Economics, by James H. Shoemaker, Completed June 26, 1915—Part II, The Corporate Telephone Organization, by J. C. Kelsey and S. R. Edwards, Completed September 25 Part III, Telephone Accounting and Auditing, Written by James H. Shoemaker

Quiz Questions on the Preceding Installment.

110. State the views of three classes of people regarding an audit.

111. What is the modern idea of an audit? Upon what principle is the audit being recognized as a necessity and an economy?

112. What may be said to be the main purpose of an audit?

113. Give the reasons why preparation for an audit is its most beneficial effect.

114. What must the auditor do in the course of his work? What kind of ability is it essential that he have?

115. Detail the four main purposes of an audit.

116. What precaution may be taken to prevent fraudulent entries?

117. Why should auditors possess good intuition and ability to apply the law of averages?

CHAPTER X. Auditing (Continued).

118. *Beginning an Audit.*—Ordinarily the first step in the making of an audit is to walk in, unexpectedly, and ask for the keys to the cash—or to ask the man in charge to produce and count his cash in the presence of the auditor. Immediately following this step the bank account is verified by checking with the bank to determine what checks are outstanding or floating. In this manner, the actual cash on hand and the bank balance are ascertained and recorded before anything else is attempted.

119. *Dealing With Ordinary Errors.*—Some auditors refuse to locate and correct errors known to be in existence at the time the audit is begun. If the accountant in charge knows that he is "out of balance," the auditor may say to the management of the company employing him: "You can find someone who will locate errors of this kind more cheaply than I can afford to locate them for you. When you have your accounts in perfect balance, I will begin the audit."

Occasionally a company becomes convinced that the only way in which it can have its books balanced is to call in an auditor to do the job, but, strictly speaking, that is not an audit. It might better be called a course of instruction in plain bookkeeping.

120. *The Safeguarding of Funds.*—A custom which seems to be growing in favor, and one which the author would urge as worthy of adoption by every company, large or small, is that of depositing the total of every day's receipts in the bank. By this means it is made easy to trace every penny of income directly to the company's common treasury.

The objections which may be raised to this plan are numerous, but not one of them is of sufficient importance to warrant deviation from its most rigid practice. For the payment of small items, a petty cash allowance, or working fund, can be kept in the cash drawer, and used therefrom in exactly the same general manner as a cash working fund is advanced to an employe. As this fund becomes exhausted, the itemized account of the things for which it has been paid out can be turned in and a check drawn on the bank to replenish the working fund.

Another objection sometimes raised is this: A check is drawn against the company's account in the bank in payment of some specific item, and the person receiving the check insists upon having it cashed in the company's office. Even in a case of this kind, there need be no deviation, whatever. The check thus received can be deposited in the bank exactly the same as other checks, taken in from patrons for the payment of service or for any other reason. Banks are thoroughly familiar with the reasons why a company should include its own checks in this manner with its deposits.

It is sometimes objected that money or checks will be received after the hour at which the banks close. To meet this contingency, it is only necessary to close the day's business at whatever hour best suits the completion of the day's deposit, and include the receipts of the balance of that day in the next day's report. If there seems to be sufficient need, a rubber stamp may be used to show that the actual time of the receipt of certain payments was after the closing of the report of the preceding day.

121. *Making Every Payment by Check.*—One of the important items connected with the matter of audits is the practice of making every payment by check. As has just been indicated in the preceding section, there are exceptions to this general rule—exceptions which are provided for by the use of a petty cash account or an office working fund. The principle and the practice are kept intact, however, by the itemizing and vouchering of every such item in connection with the check issued from time to time for the replenishing of the working fund.

When each day's receipts are scrupulously and invariably deposited in the bank, and when every cent is thus paid out by check, the bank is a perfect treasurer's record and auditing is greatly facilitated. In fact, it is an extremely expensive luxury for a company to follow any other method, if it expects to have its accounts audited.

122. *Inventories, Depreciation, Etc.*—In the auditing of other businesses, a great deal depends upon the accuracy of the accounts receivable, the inventory of stock on hand and the manner in which depreciation is dealt with. But in the future auditing of telephone accounts, these items are apt to be determined very largely by practices established by the federal and state commissions.

Until the commissions have completed their standards for

these matters, however, they will continue to be the items of greatest importance for the auditor who wishes to give a reliable figure covering the losses or gains of the business. They will continue, in like manner, to be the items of greatest concern, also, to the owners of the business—even when no audit is being attempted.

123. *Intangibles, in an Audit.*—In every audit there are certain intangibles which have to be dealt with. Just now the intangibles of telephones and railroads, while having definite recognition as an account in the uniform accounting systems, are in dispute as to their status as an asset. The auditor of telephone accounts will do well to keep in closest possible touch with the discussions which are now in progress concerning the entire subject of "valuation" which includes this item of intangibles. Until time has determined the matter, each auditor will have to be his own guide, as the authorities, if there be any, are certainly *not agreed,* even among themselves, as to what shall or shall not be allowed as intangibles.

124. *Relationship Between Auditor and His Employer.*—Of first importance is the question as to how far the auditor may defer to the ideas or influences of the concern whose business is under investigation. The ideal attitude for the auditor is that in which he stands ready to sacrifice the company's patronage, at a moment's notice if need be, rather than swerve one hair's breadth from what he himself conceives to be necessary in the performance of his duty. This, of course, does not require that the auditor make himself obnoxious.

When a physician is called it is assumed that as long as he continues in charge of the patient, there will be no questioning of his judgment or ability. The only proper way to disagree with a physician is to dismiss him and call another. The only way for an auditor and the institution which he happens to be serving, to disagree is for their relations to be severed.

125. *The Auditor's Most Difficult Task.*—This brings us face to face with the auditor's most difficult task, which is: The complete mastery of the business which he undertakes to audit. Some one has said that the auditor must enter the most sacred and vital precincts of the temple of business—the holy of holies, so to speak. It will be well for him, therefore, to be fully prepared for his most sacred as well as important undertaking. Ignorance on his part will quickly bring upon him well deserved contempt.

There are times when the representatives of the business that is being audited, make the mistake of assuming that the auditor is all wrong when, in reality, he is merely misunderstood. It is surprising how many businesses have lived for longer or shorter periods without their managers ever having had the remotest knowledge of the things which are required by an effectual audit. Therefore, when trouble arises between the auditor and those who are being audited, it is apt to be the latter that is in the wrong.

126. *Diplomacy of an Auditor Not Always Deception.*—It is easily seen, therefore, that the pathway of even the most efficient auditor is not always strewn with roses. On the contrary, common-sense diplomacy is about as necessary for an auditor as for any other man in the whole world. Says one authority: "He must avoid placing himself on the footing of a mere clerk in his relationship to the head of the office. He must preserve his complete independence and self-respect, while at the same time, he must be careful not to arouse antagonism by too great an assertiveness."

127. *The Most Trying Part of an Audit.*—There is scarcely a manager who does not have certain foibles which he insists upon as tenaciously as though they were absolute essentials. Certain of these foibles may have to do with minor practices which in no way detract from the desired final result. It is sometimes trying when an auditor sees that he must overlook foibles of this kind. But, if the management of the business is to continue without change, it is better for the auditor to "swallow his own saliva" in all cases of minor import than to "make the manager eat it and like it." The chances are two to one that he will not "eat it," in the first place and, if by any chance an unwelcome practice is rammed down his throat, he is most sure never to like it.

128. *The First Audit.*—It should be expected, both by the employing company and by the auditor employed, that considerable extra time shall be expended before the first audit gets in full swing—extra time devoted to a more or less comprehensive special study of the particular business that is to be reviewed. Even though the auditor is in the habit of reviewing other businesses of the same kind, there are special features about every separate institution which require special study in advance of an audit.

129. *The Report Which Accompanies the Completed Audit.* It is in the recommendations which accompany the figures of an audit that the real value to the employing company should be found. In this report the auditor has a chance to render value received to the institution which has honored him with its confidence. He should leave out nothing that he considers of value to the business, nor should he encumber this part of his results with any unnecessary or irrelevant words. In this report, as in all matters of business, it is necessary to discriminate between the things that are of greater importance and those that are of lesser importance.

Conclusion of Part III. Telephone Accounting and Auditing.

Quiz Questions on This Installment.

118. What is the first step in making an audit?

119. Why do some auditors refuse to locate and correct errors when books do not balance?

120. What custom relative to handling funds is growing in favor? What objections are raised against the plan and how may they be answered?

121. Why is it advocated that all payments be made by checks?

122. What items are of great importance to the auditor in making his investigations? How will these items be largely determined in the future?

123. What accounts are in dispute as to their status as assets?

124. State the ideal attitude of the auditor as regards the performance of his duty.

125. What is said to be the auditor's most difficult task?

126. Why is diplomacy necessary in an auditor?

127. When is it policy to yield to whims of the manager?

128. What may be expected by the company and auditor in regard to the first audit?

129. In what part of the auditor's report should the real value to the company be found?

From Factory and Salesroom

Conventions: Illinois, Springfield, January 18-20; Minnesota, Minneapolis, January 25-26; Wisconsin, Madison, February 9-11; Kansas, Topeka, February 15-17

New Water and Weatherproof Batteries.

The United Battery Corporation, 160 John Street, Brooklyn, N. Y., has succeeded in placing on the market a dry battery which is said to be absolutely waterproof and impervious to all harmful climatic conditions.

It is well known that dry batteries decrease in efficiency through moisture which is mostly due to the excitation caused by the transference of energy between the negative and positive poles, this being principally due to superfluous moisture in the atmosphere affecting the zinc container. They are also greatly affected by excessive heat or cold, under which conditions they lose not only their amperage, but their recuperative powers.

Master Waterproof Battery.

In the Master battery, these difficulties are claimed to have been entirely overcome. The zinc cup is sealed within the outer waterproof container. This is done by outwardly flaring the upper edge of the zinc cup, thus allowing a dead air space between the zinc cup and the outer container. The cell itself is coated with a special bitumastic varnish which, in itself, is impervious to moisture and also forms an insulative coating. In addition, a jacket of asbestos is placed around the zinc container, thus providing a protective covering which is a poor conductor of heat.

This construction, it is contended, enables the cell to retain comparatively a uniform temperature, while outside changes affect it but slowly. In addition, the electrolytic paste and depolarizing compound inside the cell are also protected to a very great extent against atmospheric changes. The outer carton is made of a water-resisting material, interlined with paraffine and coated inside with an extra heavy layer of this material. As the cell is permanently sealed in the outer container, this secures the outer carton to the cell, and thus forms a unit from which the outer carton cannot be moved or replaced in a fraudulent manner.

To insure the rigidness of the outer carton and to make such carton waterproof, the ordinary fiber bottom cap usually found on batteries, is replaced by a black japanned metal bottom which is insulated from the zinc cup by a specially formed paraffined paper cap. Although the cost of manufacturing this type of cell is said to be considerably higher than that of the ordinary cell, this new patented battery is marketed at a price to compete with it.

The company which is placing these batteries on the American market, is well known in the battery field, having factories in Toronto, Canada and Manila, P. I. An up-to-date modern plant of very considerable size has been recently completed to manufacture these new cells exclusively. Having adopted the trade-mark, "Master," for its product, the company states that the word will be indicative of the quality of its cells.

The United Battery Corporation will not only manufacture the standard sized batteries, known as No. 6, 7 and 8, but will also invade the field of the flashlight industry with a complete and up-to-date line of flashlight cases, lamps and batteries.

New Corwin Telephone Mfg. Co.

The Corwin Telephone Mfg. Co. was recently incorporated under the state laws of Indiana to engage in the manufacture and sale of intercommunicating telephone systems at Lafayette, Ind. E. R. Corwin, president of the new corporation and for several years connected with the Frank B. Cook Co., of Chicago, and M. J. Corwin, secretary and treasurer, are the principal stockholders.

Mr. Corwin has purchased from the Frank B. Cook Co. all patents, rights, tools and materials pertaining to the Corwin intercommunicating system. All patents, rights, tools, dies, and materials belonging to and in possession of the trustee of the Lafayette (Ind.) Electric & Mfg. Co., which was formerly the Sterling Electric Co., have also been purchased by Mr. Corwin.

An inventory of both companies' materials is now being made, at the completion of which the company will be prepared to fill orders for intercommunicating systems together with the line previously handled by those companies, with the exception of the protective apparatus.

Phoney Bill Welcomes the New Year In.

The January blotter calendar of the Stromberg-Carlson Telephone Mfg. Co., of Rochester, N. Y., as may be seen in the accompany illustration, depicts Phoney Bill welcoming the New Year in with a beaming countenance. Although he is a firm believer in the proverb that "early to bed and early to rise makes a man healthy, wealthy and wise", Phoney Bill makes an exception on this occasion. "You're always right on time," he says, pointing to the

Phoney Bill Says: "You're Always Right on Time."

THE LATEST IN AUTOMATICS

The RELAY AUTOMATIC
Telephone System is

IN OPERATION

AT

MARCONI HOUSE
STRAND
LONDON, ENGLAND

PLANTS BUILDING

FOR THE

SWEDISH GOVERNMENT TELEGRAPH DEPARTMENT

AND FOR

A TOWN IN EUROPE

Our System will give you every class of Automatic Telephone Service by the use of

RELAYS ONLY

The Relay Automatic Telephone Co., Ltd.

IN CARE OF Marconi Wireless Telegraph Co. of America

WOOLWORTH BLDG., NEW YORK

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

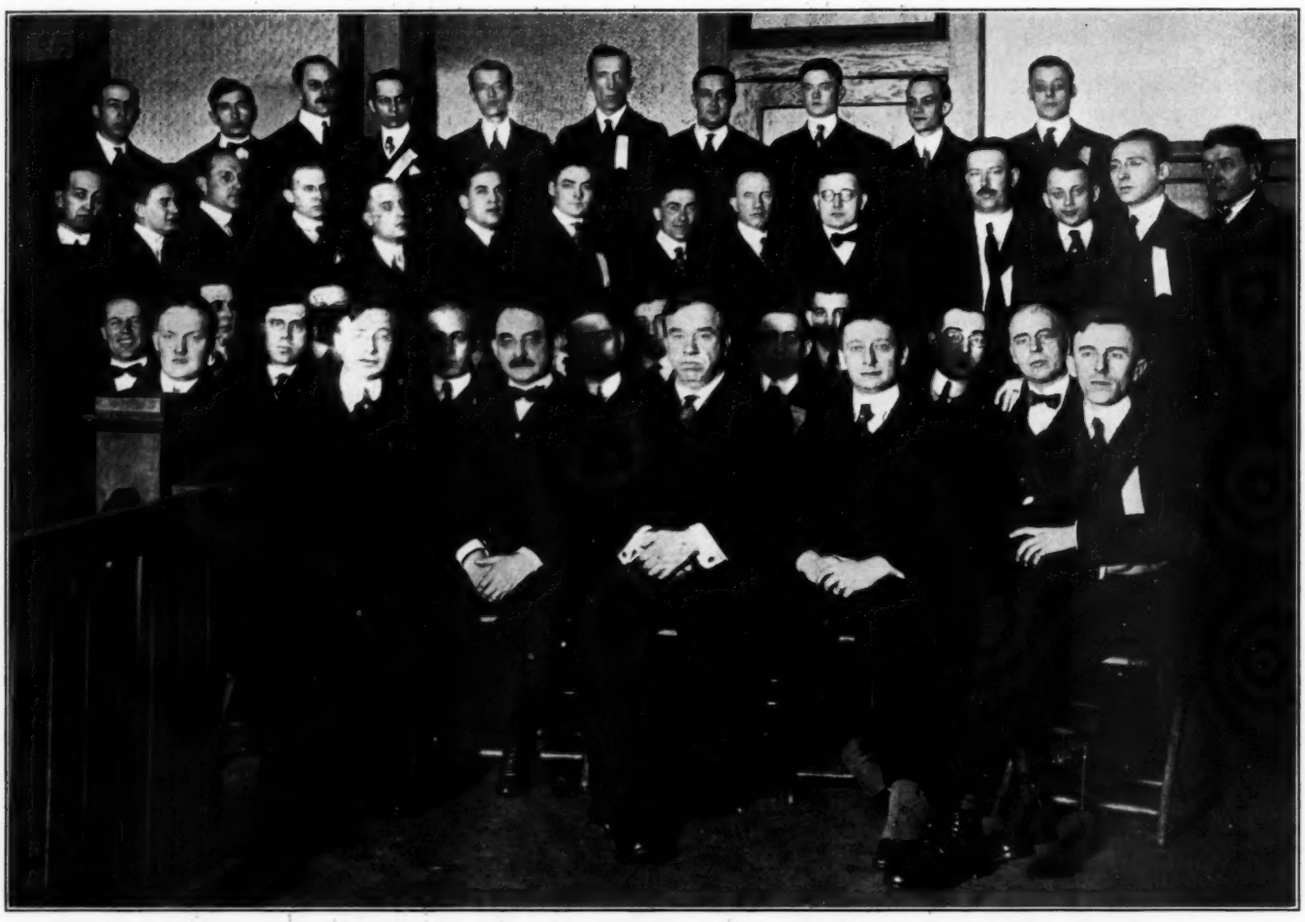
clock which is presumably striking "12," and sees the infant "1916" just entering the hall.

The dates for the convention of the Minnesota Independent Telephone Association, to be held at Minneapolis January 25 and 26, are shown in blue letters. Phoney Bill takes this means of reminding telephone men that "Quality Apparatus" will be exhibited at that convention.

Annual Sales Meeting of the Garford Mfg. Co.

On Friday, December 31, a tired but happy lot of salesmen packed their grips preparatory to leaving Elyria for their respective territories, after a strenuous but exceptionally successful and enthusiastic sales meeting. To a man, they said—officials included—that it was by far the most successful meeting of the kind ever held by their organization—lots of action, lots of orders, and lots of good, sound information.

Getting the salesmen together is an annual event with the Garford Mfg. Co., and one looked forward to with great interest by reason of the splendid programs, information to be had and exchange of helpful plans and ideas.



Traveling Representatives and Officials of the Garford Mfg. Co. in Attendance at Its Annual Sales Meeting at Elyria, Ohio.

Beginning Tuesday morning, December 28, sessions were held regularly both morning and afternoon, under the direction of the various department heads with discussions by the travelers bringing out in every case the best points of the subject-matter.

The department heads active in the meeting were as follows: G. A. Scoville, sales manager; A. L. Patrick, treasurer; Ray H. Manson, chief engineer; S. A. Beyland, assistant chief engineer; D. A. Glover, auditor; H. L. Harris, F. L. Clark, sales engineers; J. R. Millspaugh, factory manager; L. E. Bonsieur, superintendent; W. C. Strong, manager of the order department; R. M. Allen, manager of the accessory department, and A. V. Overshiner, advertising manager. Good talks given by A. L. Garford, president, and A. G. Bean, general manager, were to the point and full of helpful information and suggestions.

The banquet given Tuesday evening under the direction of Mr. Scoville, who acted as toastmaster, was a decided success. Speeches by out of town guests, H. B. McMeal, of TELEPHONY, Chicago, and J. M. Lenz, of Chicago, were received with hearty applause.

The travelers in attendance at the meeting were: A. J. Roberts, manager of the Kansas City, Mo., branch; F. M. Coker, manager of the Dean Electric Co., Los Angeles, Cal.; J. M. Abrams, manager of the Dean Electric Co., Seattle, Wash.; C. H. Annis, manager of the Sumter Telephone Supply Co., Sumter, S. C.; W. H. Scott, S. O. Vaughan, R. Davis, M. D. Wood, J. F. Goss, F. C. King, A. B. Smith, Homer Stephens, A. A. Cronk, Dick Faulhaber, E. L. Klingel, Chas. L. Ward, Ed. E. Piper, E. G. Fehrenbach, Price Winemiller, Hall T. Glessner, J. M. Thomas, R. F. Peters, G. L. Ferguson and F. J. Buol.

Wednesday evening the travelers tendered a banquet to the officials of the company, a much enjoyed event. Homer Stephens, as toastmaster, was a "hit."

Cracraft, Leich P. B. X. Installed in Indianapolis Hotel.

The Cracraft, Leich Electric Co., of Genoa, Ill., has just completed the installation of a common battery private branch exchange for the Oneida Hotel, Indianapolis, Ind.

The switchboard consists of a 100-line low type mahogany cabinet fully equipped. The Cracraft-Leich com-

CONDENSERS

A Word to Makers and Users of Condensers

You want to make, or buy, the most reliable and up-to-date Condenser.
Then use, or specify, Metallized Paper—Mansbridge patent—instead of the old fashioned solid foil.
Condensers made with solid foil break down internally sooner or later, generally **sooner.**

Mansbridge Type Condensers are Self-Sealing and cannot be internally short-circuited. If one is broken down by a lightning or high-tension discharge, or by mechanical damage, it automatically and instantaneously seals up, this being the unique and characteristic property of the metallized paper.
You can drive a pin right through a Mansbridge Condenser and the capacity and insulation will still be O. K.! Sounds impossible, but it's solid fact!
Sample—complete with pin—sent to any skeptic.

Millions—literally millions—of Condensers made from metallized paper—Mansbridge process—are now in use all over the world, and the number of satisfied users increases daily.

Complete Satisfaction

That's the reason why the Mansbridge Condenser has made good.

Mansbridge Condensers are **More Reliable, Lighter, Smaller and no more Costly** than those of the old fashioned solid foil type.

They have been adopted exclusively by the English government Telegraph and Telephone Administrations; and they are made under license by Western Electric Company, Ericsson Mfg. Co., Electric Specialty Co., Stromberg-Carlson Co., American Electric Co., and by numerous other licensees all over the world.

Insist upon having MANSBRIDGE CONDENSERS and save money in first cost, and also in maintenance.

For full particulars and for terms of manufacturing license in U. S. A. and Canada apply:

G. F. MANSBRIDGE, Mount House, New Barnet, England

AS LONG AS THEY LAST

$5.75

Cabinet common battery type, golden oak.
Generator, 3-bar.
Ringer 100w, 1000w. or 1600w.
Receiver, double pole, permanent magnet.
Transmitter, local battery.
Induction coil, standard.
Battery, 2 dry cells.
Circuit, series or bridging.

New Telephones

$6.50

Cabinet, common battery type, golden oak.
Generator, 4-bar.
Ringer, 1000w. or 1600w.
Receiver, double pole permanent magnet.
Transmitter, local battery.
Induction coil, standard.
Battery, 2 dry cells.
Circuit, bridging.

Slightly Shop Worn

Corwin Telephone Mfg. Co., Lafayette, Ind.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

pany also furnished the necessary telephones which are of its standard wall type, provided with direct current receivers.

Garford Company to Exhibit at Illinois Convention.

The Garford Mfg. Co., of Elyria, Ohio, is planning to have an extensive display of its apparatus at the convention of the Illinois Independent Telephone Association, to be held at Springfield, January 18, 19 and 20. The exhibit, which will be located in Room 308, will be in charge of S. O. Vaughan, Illinois state representative; H. L. Harris and F. L. Clark, sales engineers, and A. V. Overshiner, advertising manager.

A Greeting to Telephone Companies.

The January issue of the Automatic Telephone, the monthly house organ of the Automatic Electric Co., Chicago, contains the following greeting to telephone companies by Sales Manager H. A. Harris:

For Nineteen Sixteen.

The year 1915 has been a gratifying one for the companies engaged in the operation of telephone properties throughout the country. During this period their position has been materially strengthened and their business placed on a more substantial basis than ever before. They have shared in the general prosperity that has blessed our country. The service they have rendered has been more highly appreciated and their securities have commanded a greater place in the confidence of the investing public.

The New Year will offer many opportunities to these telephone companies, and these opportunities will be grasped and provided for with the same careful and studious ingenuity which has made the telephone the most important of our public utilities.

Automatic Electric Co. desires to congratulate these companies upon their success, a success which is the result of constant effort and wise management, and wishes to convey its sincere hope that the New Year will bring them still greater achievement.

Book Reviews.

PRINCIPLES AND PRACTICES OF COST ACCOUNTING, by Frederick H. Baugh, P. O. Box 682, Baltimore, Ind. Published by the author; 194 pages, 5¾ ins. by 8½ ins. Price $3.

The need of systems of cost accounting in the great majority of business organizations is more and more evident, for the large margin between the selling price and the cost is rapidly being reduced through competition and it is essential to know what the costs are to avoid doing business at a loss. This book has for its object a comprehensive and practical presentation of the general principles upon which cost accounting of manufactured articles is based, the application of these principles in a general manner to the most common types of manufacture, and the illustration of the details.

In writing the book it was aimed to illustrate the principles by methods which eliminate from the financial accounts and segregate the quantities and values used on the manufactured goods into accounts known as the cost accounts. The methods outlined call for little, if any, addition to the books which a corporation should ordinarily possess for the recording of its transactions.

In order that the distinction between financial or ordinary accounting and cost accounting may be clearly understood, a synopsis is given of financial accounting following the introductory chapter which discusses cost accounting and its purposes. The principles of cost accounting are then considered in detail, the various kinds of costs and units being discussed and a general outline of the accounts given. The different costs such as specific job, departmental and process, are next taken up in separate chapters.

The two concluding chapters contain illustrations of departmental and process costs accounts. A most complete index is presented so that any particular topic may be quickly found.

INVENTIONS AND PATENTS, by Philip E. Edelman. Published by the D. Van Nostrand Co., New York; 288 pages, 5 ins. by 8 ins. Price $1.50.

There are many persons desirous, at some time or another, of knowing whether an article is patentable, what protection a patent affords and what the necessary steps are to secure one. This volume, while designed particularly for all persons interested in patents such as inventors, investors, or manufacturers, will be of interest to the layman who may sometime contemplate an invention.

People have spent time and money on unpatentable ideas, valueless inventions, worthless patents, etc., while others neglect opportunities offered by the patent statutes and fail to protect valuable inventions. The book is intended to point out the steps necessary in taking out a patent and the mistakes to be avoided. It is the result of a close study by the author. It embraces the experiences of many inventors and patentees, and contains much information of practical value.

In writing it, the idea kept in mind was to prepare a text and reference book for all persons interested in patents.

After discussing inventions and the steps leading up to securing a patent, consideration is given to patent rights and how they are utilized, disposing of them, and infringements. A chapter is devoted to a discussion of foreign patents, and the book closes with chapters on inventors, inventions and the present status of inventions.

Condensed News Reports

Officers of Companies Are Urgently Requested to Forward to Us Promptly All Financial and Other Statements as Soon as Issued and Any Items of Interest as to Their Plants and Systems

Personals.

E. N. VEATCH, formerly district plant chief of the Cumberland Telephone & Telegraph Co., at Frankfort, Ky., has been transferred to Louisville, where he will be in charge of the plants of the entire state for the company.

ROSCOE SMITH has severed his connection with the Decatur Home Telephone Co., of Decatur, Ill., with which he has been associated for the past two and a half years, to accept a position as assistant wire chief with the Kinloch-Bloomington Telephone Co., of Bloomington, Ill.

J. W. RONEY, who has been plant and traffic superintendent of the Coos & Curry Telephone Co., with headquarters at Marshfield, Ore., left there January 1 to take a position with the Western Electric Co. in Chicago. Earl W. Gates, wire chief, has succeeded to the head of the plant department and the traffic duties have been undertaken by James E. Montgomery, commercial superintendent.

HENRY LINTON REBER, vice-president and general manager of the Kinloch Telephone Co., St. Louis, Mo., since 1909, has been elected president of the company, succeeding William D. Orthwein, who is retiring because of ill health. He will retain his title as general manager. Mr. Reber has been connected with the Kinloch company since 1899, when he became chief engi-